REPORT DOCUMENTATION PAGE		Form Approved OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE 14.Nov.03	3. REPORT TYPE AND DATES COVERED DISSERTATION

4. TITLE AND SUBTITLE "UNDERSTANDING TREATMENT DROPOUT IN OUTPATIENT MENTAL HEALTH SERVICES: AN ECONOMIC FRAMEWORK EXPLORING THE RELATIONSHIP BETWEEN PATIENT SATISFACTION AND APPOINTMENT	5. FUNDING NUMBERS
6. AUTHOR(S) MAJ OZANIAN RHONDA G	

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) COLUMBIA UNIVERSITY	8. PERFORMING ORGANIZATION REPORT NUMBER CI02-1305

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) THE DEPARTMENT OF THE AIR FORCE AFIT/CIA, BLDG 125 2950 P STREET WPAFB OH 45433	10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION AVAILABILITY STATEMENT Unlimited distribution In Accordance With AFI 35-205/AFIT Sup 1	12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)
20031126 028

14. SUBJECT TERMS			15. NUMBER OF PAGES 200
			16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT

Understanding treatment dropout in outpatient mental health services: An economic framework exploring the relationship between patient satisfaction and appointment noncompliance

Rhonda G. Ozanian

ABSTRACT

Understanding treatment dropout in outpatient mental health services: An
economic framework exploring the relationship between patient
satisfaction and appointment noncompliance

Rhonda Gillespie Ozanian

Noncompliance in the form of treatment dropouts is a major problem across outpatient
mental health settings and can range from 40-50% of all clients. Previous research has
overlooked the impact on resource use and research. Economic theory suggests
noncompliance is consumer signaling about patient preferences. The mental health industry
standard for evaluating patient preferences is the patient satisfaction measure. This study
examined the relationship between treatment noncompliance and patient satisfaction
hypothesizing that, after controlling for sociodemographic and health status factors, patient
satisfaction will predict duration of mental health treatment. Using 1996-1999 data from the
Agency for Healthcare Research and Quality Medical Expenditure Panel, a satisfaction
measure was constructed and regression models developed to examine the impact of
satisfaction on treatment duration for patients having at least one mental health visit.
Survival analysis was used to examine the hazard rate of patients having high versus low
satisfaction. Major findings suggests individuals satisfied with and having confidence in the
provider were significantly more likely to have a subsequent visit. The importance of
satisfaction in predicting treatment continuation was not constant with respect to number of
visits or patient sociodemographic characteristics. Satisfaction was strongly predictive of
continuation for college educated and individuals with a mental health diagnosis, but less
significantly important for African Americans, high school educated and individuals age 25-
44. Practical aspects of care such as access were significantly more important for Hispanics
and publicly insured. Evidence suggests there is a distinct group of consumers who seek and

are satisfied with consultation only. MEPS design measures satisfaction with 'usual source of care' lacks specificity and does not reflect satisfaction specifically with mental health care. The role of treatment preferences needs to investigated further. Patient satisfaction measures require redesign to account for opportunity costs and preferences. Preference measurement techniques may be are better suited. Treatment noncompliance should be the gold standard on which the validity of satisfaction and preference measures are based.

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Acknowledgements

I would like to acknowledge the support of the following dissertation committee members, Columbia University faculty and fellow students who supplied the vision, wisdom and comfort needed for me to complete my studies and write my dissertation

Edward J. Mullen
Julien O Teitler
Jane Waldfogel
Sherry Glied
Mark Olfson
Denise Burnette
Ada Mui
Steven Schinke
Sheila Kamerman
██████████ (fellow student and terrific husband)
Mara Curtis
Briana Barocas
Sakiko Tanaka
Ki-Bum Song
Rogerio Pinto
Brian Lam

Dedication

To my husband and best friend █████ and my wonderful children ████████████████████

CHAPTER 1 Introduction

Current prevalence rates indicate that about twenty percent of the U.S. population are affected by mental disorders in a given year, yet two-thirds never seek treatment (U.S. Department of Health and Human Services, 1999). In the last two decades researchers and policy makers have been interested in identifying and removing barriers to allow greater access to mental health care. However, even with the availability of health insurance and publicly subsidized care, many Americans are reluctant to make use of the outpatient mental health care system (Zuveckas, 2001). Certain groups such as African Americans, the elderly, the uninsured, and individuals with fewer years of education seem particularly prone to underutilize outpatient care, either by never entering care, or by leaving treatment early (Swartz et al., 1998).

The focus of this dissertation research is on persons with a mental health disorder who seek-but do not complete outpatient mental health treatment. Of those who seek care, one can expect 40-50 percent will terminate from care early-many after only the first visit (Wierzbicki & Pekarik, 1993; Killapsy, Banerjee, King, & Lloyd, 2000). Treatment dropouts in mental health are persistently high, distort important research findings, limit the effectiveness of psychological treatments, and are a major source of economic inefficiency (Phillipson & Hedges, 1998; Ellickson, Stern, & Trajtenberg, 1999; Hughes, Bagust, Haycox, & Walley, 2001). Patients who leave treatment early do so presumably against medical advice and are systematically deemed treatment noncompliant (Donovan, 1995). Treatment noncompliance is defined as the failure of the patient to follow through with treatment regimens or the degree to which patient

behavior is congruent with treatment recommendations. There are many ways in which a patient might be perceived as noncompliant with treatment. In the context of this research use of the term will be limited to appointment noncompliance, or not following through with appointments for mental health visits.

Economic theory suggests that noncompliance is a choice consumers make about consumption of health care based on valuations of the costs and benefits of care, among other factors (Lee, 1995; Hughes et al., 2001). A universal measure that seeks to reveal patient valuations and experiences with their health care is the patient satisfaction survey. If treatment noncompliance is economic behavior resulting divergent patient valuations and preferences for care (Rao, Weinberger, & Kroenke, 2000), and if patient satisfaction is an adequate measure for revealing these valuations, then a relationship may exist between satisfaction with care and duration of treatment. Using 1996-1999 data from the Agency for Health Care Research and Quality (AHRQ) Medical Expenditure Panel Survey (MEPS), I will to examine the relationship between treatment compliance and satisfaction with outpatient mental health care predicting that, after controlling for sociodemographic and health factors, satisfaction with care will be associated with duration of treatment.

What are the implications of treatment noncompliance in mental health care? First, by illuminating only our success with those who comply, noncompliance has globally distorted the industry's understanding about the effectiveness of treatment. Treatments which demonstrate efficacy in clinical studies do so among a select group of patients, who themselves have remained in the trial (I. M. Anderson & Tomenson, 1995). By selecting into research findings only those who comply, clinical research can

overestimate the effectiveness of treatments (Phillipson & Hedges, 1998). When treatments deemed efficacious in clinical studies are deployed to practice settings their effectiveness becomes further diluted by the effects of noncompliance (G. Simon, Wagner, & Vonkorff, 1995). Perhaps this is one reason why the effectiveness of mental health treatments has been slow to catch up with the growing popularity of psychotropic medications where in research compliance rates are a critical study outcome. Although rates of mental health treatment have increased by 48 percent since 1988, the number of and spending for psychotherapy visits is declining (Olfson et al., 2002). In its place spending on psychotropic medications has doubled (Glied, Frank, McCormack, & O'Malley, 2001; Zuvekas, 2001).

A second implication is that treatment noncompliance generates inefficiencies both in, and beyond, the health care system. From the health care perspective, reduced treatment effectiveness can result in subsequent additional diagnostic and treatment procedures. The severity of disease, cost of treatment, and opportunity of the doctor determine whether savings from delivering less treatment offsets the cost from increased morbidity (Cleemput, Kesteloot, & Degeest, 2002). There are significant indirect costs from treatment noncompliance that occur outside the health sector. An untreated or partially treated mental health problem can create family, social and legal problems that spillover into the community and affect costs in the public sector. Although some research has been done to estimate these, the costs are not identified in the majority of mental health economic evaluations- often because prices per se do not exist for these kinds of public sector costs (Drummond, O'Brien, Stoddart, & Torrance, 2000).

A third implication of noncompliance is that it reduces patient welfare by preventing patients' from receiving maximum treatment benefits (Killapsy et al., 2000). This is because noncompliance with treatment results in an insufficient level of medical care being delivered than is needed to obtain the desired health effects. In spite of third party payer criticisms about the effectiveness of many psychotherapy treatments, it is nonetheless accepted that psychotherapy methods alone or in combination with medication, case management and other forms of treatment, are effective at reducing the symptoms of mental health disorders, improving the quality of life for patients, and providing a cost-effective menu of treatments.

Patient acceptance of the available psychological treatments and the lack of industry knowledge regarding the value patients place on treatments are major concerns. Equally disturbing is that the mental health industry may not recognize the magnitude of the problem (Howard, Davidson, O'Mahoney, Orlinsky, & Brown, 1989; Mueller & Pekarik, 2000), or the impact it has on advancing the field of psychological treatments. Those who drop out from treatment are rarely asked why since they disappear from the clinical setting and become difficult to access (Pekarik, 1992). Whether patients do not improve because they drop out of care, or whether they drop out of care because they do not improve is an important distinction. If the reason for dropping out is dissatisfaction with the treatment, then word-of-mouth effects could be an invisible but devastating contributor to the stigma of mental health care (Jones & Sasser, 1995; Takeuchi, Sue, & Yeh, 1995).

Measuring patient satisfaction is regarded as one of the principal methods for obtaining patient evaluations of care across health and human service settings (Carr-Hill,

1992; Avis, Bond, & Arthur, 1997; Williams, Coyle, & Healy, 1998). Although current measures of satisfaction tend to be conceptualized globally and lack an agreed upon theoretical base, the possibilities as a window into the patients attitudes, beliefs and preferences for care remains (Lebow, 1982; Carr-Hill, 1992). Compliance on the other hand is a clear behavioral measure of patient valuations and abilities to follow through with care (Phillipson & Hedges, 1998; Ellickson et al., 1999). The patient satisfaction survey has served as a proxy for patient valuations in at least one other study with researchers finding that satisfied patients are more inclined to comply with recommended treatment and keep appointments than dissatisfied patients (Carlsen & Grytten, 2000). Although some types of compliance are difficult to measure such as medication compliance, noncompliance with psychological treatments is clear and can be independently verified through missed appointments and early termination (Lebow, 1982).

For this research mental health care is conceptualized as a subspecialty of health care. The empirical literature to support the study comes from both health care and mental health research and the theoretical model originates in economics. The major constructs: treatment compliance and patient satisfaction, are operationalized similarly across both health and mental health settings. Characteristics of treatment and the range of patient responses in terms of economic behavior is similar. There are some additional distinctions with regard to terminology. The terms 'treatment noncompliance', 'treatment dropout ' and 'early termination' have the same meaning, but the terms vary by literature. In the mental health practice literature the terms are 'treatment dropout' or 'non-adherence'. In the economic and health care literature the term is 'treatment noncompliance' or 'noncompliance'. Because 'level of use' serves as a proxy for

treatment noncompliance, there are additional terms to clarify from the mental health utilization literature. The terms 'demand', 'patterns of utilization', and 'level of use' are used to refer to the duration of mental health treatment. Other terminology is generic using 'patient', 'doctor', 'treatment' and 'health care' to indicate a client or patient, physician or mental health specialist, medical or psychological treatment, and health or mental health care, respectively.

In both the mental health and health care literature, researchers have examined patient characteristics related to utilization and compliance (Olfson & Pincus, 1994b, 1994a; Alpine & Mechanic, 2000), patient characteristics relating to clinical outcomes, patient characteristics relating to satisfaction with care (Hoff, Rosenheck, Meterko, & Wilson, 1999) (Marshall, Hays, & Mazel, 1996), clinical outcomes relating to compliance, and clinical outcomes related to satisfaction (Ankuta & Abeles, 1993) (Plante, Couchman, & Hoffman, 1998) (Lambert, Salzer, & Bickman, 1998; Pekarik & Guidry, 1999). However, only three published mental health studies (Pekarik, 1992; Brannan, Sonnichsen, & Heflinger, 1996; Mueller & Pekarik, 2000) have examined the influence of satisfaction on treatment compliance. Pekarik (1992) found differences in patient satisfaction between dropouts and completers of treatment, but employed only a single global measure. Brannan et al. (1996) found a statistically significant relationship between the patient-provider relationship and length of treatment, but data was drawn on active patients at six month intervals - well beyond the point when most dropouts leave care. Mueller and Pekarik (2000) examined the relationship between expected and actual duration of treatment finding that patients attending fewer sessions had lower satisfaction, but the focus of this study was on the accuracy of therapist versus patient expected treatment duration.

By adopting an economic framework, this research implicitly challenges the theoretical models which have previously driven research on health care utilization and compliance, such as the paternalistic, socio-behavioral model and health belief models. The paternalistic model has a long tradition is medicine and is based on the deeply imbedded philosophy that noncompliance is a failure on the part of the patient to follow doctors instructions. The doctor is the ultimate authority for deciding what is best for the patient and noncompliance results from patient flaws that are outside the bounds of responsibility of the doctor (Trostle, 1988). Paternalism has played a role in past research less as a theory than as a subtle bias limiting research only to that which reveals characteristics of the patient that contribute to noncompliance.

The socio-behavioral model has been dominant in health utilization research. According to this model, utilization of health care results from an interplay between predisposing and enabling factors in the patient's environment which serve to either encourage or discourage health care use (R. M. Anderson, 1995). Factors which predispose individuals to health care utilization are age, race and gender, while factors that enable utilization are income and insurance. A second influential model is the health beliefs model which purports that individuals decide whether or not to use medical services given their beliefs and the constraints of their everyday lives. Health beliefs affecting decisions to seek care are generated from beliefs about the symptoms, perceived benefits of treatments and experience with health care (Pescosolido & Boyer, 1999).

A major criticism of these three models is that they overemphasize patient characteristics in predicting utilization without regard for how patients value the treatment in the first place. According to all three models the causes of treatment noncompliance rests primarily with the patient or within the patient environment. Increasing compliant behavior means altering patient beliefs and motivation, and removing environmental barriers. However the pervasiveness of treatment noncompliance in mental health that occurs independent of patient population or clinical settings suggests the problem is too widespread to be addressed by strategies that seek to alter patient beliefs about the benefits of treatment. A second weakness of these models is that they do not allow for the possibility that noncompliance may be a response to factors on the supply side, such as adequacy of the treatments themselves. In sharp contrast according to the rational choice theory in economics, patients do not fail to comply-they simply choose another action. If patients refuse to comply with treatment-it is the adequacy of the treatment- not the motivation of the patient that is scrutinized (Donovan, 1995). Rational choice models have been previously rejected in mental health research because of concerns about whether individuals with a mental health problem are capable of rational decisionmaking.

There are several areas of economic theory that are relevant to this research. First, utility theory also known as demand or consumer theory describes the influence of consumer preferences on the demand for mental health care. Utility is the satisfaction individuals derive from the goods and services they consume and is based on preferences and attitudes toward risk. Consumers make economic choices that maximize utility within budget constraints (Ellickson et al., 1999). Second the theory of revealed

preferences describes preferences as endogenous, e.g., determined by individual characteristics such as age, race, gender, culture, education, and shaped thereafter by experiences (Ryan, McIntosh, & Shackley, 1998; Scott, Watson, & Ross, 2002). According to both utility theory and theory of revealed preferences individuals reveal their preferences by economic behavior and economic behavior is determined by preferences and constrained by income and price. Choosing whether to comply with treatment is an economic choice. Third and more broadly relevant are the theoretical foundations of welfare economics which explain health capital, the demand for medical care as inputs into household production, distributional issues that result from market failure, and externalities related to social costs and benefits of mental health care. The following chapter establishes the theoretical framework for this research by framing the problem of noncompliance, the central role of patient preferences and the theoretical underpinnings of patient satisfaction in economic terms.

CHAPTER 2 Theoretical framework

Economic theory

Economic theory has yet to be used to explain noncompliance in outpatient mental health care. Yet it is potentially more forward thinking than paternalistic, socio-behavioral, and health beliefs models for several reasons. First 30 years of research using the latter models have yielded no conclusive findings regarding either satisfaction with care or treatment noncompliance. Second economic models have done much to advance the technology of pharmaceutical medications where compliance is an even greater burden. These advances have been achieved by understanding noncompliance is an expression of consumer signaling about preferences. When patients are not happy with the costs (side effects, pain, administration, inconvenience), or do not experience benefits from treatment, they choose not to comply. Finally economic models consider both demand and supply side factors that influence patient choices about compliance.

For this study patient noncompliance is hypothesized as a response to dissatisfaction with some aspect of outpatient mental health treatment. The nature of the dissatisfaction is unknown. However, it could be patient valuations of the costs versus benefits of care (Giuffrida & Gravele, 1998), uncertainty surrounding the physician's choice of treatment for the patient (Charles, Amiram, & Tim, 1997), or uncertainty around the effectiveness of medical care (Lee, 1995; Ellickson et al., 1999). The demand for health care is normally approached in the context of any use, and less so in the context of level of use. However, as I will describe, patients may be unable to determine how a medical treatment will improve health outcomes until they have obtained information through at

least one visit for consultation. Therefore the demand for any use reveals little about demand for the level of use thereafter. Health care is unique in that the demand for health care services are derived from the demand for health and may reflect an individual's value for health more than preferences for any particular health inputs (Grossman, 1972). The distinction is offered to illustrate the complexity in patient preferences and the demand for health care.

This section will first address consumer demand as it relates to health capital, household production, cross elasticity of demand, risk and uncertainty, and compliance costs. The second half of this section will examine supply side factors that influence demand and subsequent compliance. The role of information asymmetry, adequacy of the technology, benefits of treatment and value created will be discussed. Finally, this section will describe how treatment noncompliance and patient satisfaction with care are studied in a purely economic sense. Understanding the demand for health comes from classic economic papers of Arrow (1963) and Grossman (1972). From their research on drug therapies, Hughes et al., (2001), Ellickson et al., (1999), Giuffrida and Gravele, (1998), and Charles et al., (1997) describe the relationship between the effectiveness of medical care and its effect on compliance and patient welfare. Lee (1995), Dardanoni and Wagstaff (1990) and Pauly (1980) discuss the role of information and uncertainty in patient decision-making about care and ability to evaluate care. Patient valuations of treatment noncompliance and value created from health care interventions comes from Drummond, et.al. (2000), Hirth, Bloom, Chernow and Fendrick (2000) and Singh, Hawthorne and Vos (2001).

Demand for health

Before introducing additional economic concepts for this framework it is important to recognize how mental health care is viewed within the larger context of health care. First, there are substantial social benefits from the provision of health care. Health care generates benefits and costs that are greater than those accrued by the individual patient (Blank, 2000; Hirth et al., 2000). Referred to as externalities, this phenomenon exists when costs are imposed, or benefits conferred, which are not included in the price or cost. It is part of the market failure problem that characterizes all of health care, but is particularly problematic in mental health because of the widespread social benefits (Giuffrida & Gravele, 1998). In a market-based health care system, where only price and quantity matter, some populations will be unable to purchase health care at a price they can afford. The free market is thought to best operate without interference, but when the market fails, government intervention is sometimes justified. To correct for externalities, the government provides subsidies to finance health care benefits that the public enjoys, but the individual would not be willing to pay. To address fairness and equity issues, regulations are imposed on payers and providers to ensure health care access, and additional subsidies ensure health care availability to populations unable to pay, such as low income and the disabled.

Consumers themselves require health care, not for its own sake, but rather as inputs to produce the commodity good health (Grossman, 1972). Health is an investment consumers make to produce an output of healthy time, which is the amount of time that can be spent producing money earnings and other household commodities. The greater the wage rate, the greater the value of an increase in healthy time (Luce & Elixhauser,

1990). While shifts in human capital, like education, change the efficiency of household and labor market production, changes in health capital affect the amount of productive time lost to illness (Grossman, 1972). Mental health conditions probably create changes in both health and human capital. It is the fundamental arrangement of these commodities, not the medical inputs required to produce them, that reflect consumer preferences and make up arguments of the utility function (Pollack & Wachter, 1975). All individuals are assumed to be utility maximizers in that, within their budget constraint, they will maximize the expected value of their utility (Arrow, 1963). A potential patients' preferences are characterized by the rate of substitution between health and consumption of commodities; the more an individual loves health the more he is willing to sacrifice consumption of other commodities for health (Lee, 1995). However, not all individuals hold the same value for health and the extent to which they carry out actions to improve health will depend on whether they value health in the first place (Ellickson et al., 1999). Thus patients with a lower value on health would not be as likely to place health care ahead of inputs to produce more highly valued household commodities, and would therefore be less likely to comply with recommended health actions (Sherbourne, Hays, Ordway, DiMatteo, & Kravitz, 1992)

The demand for medical care to produce health depends on cost, utility gained from receiving care, and the degree of substitutability with other products (Ellickson et al., 1999). The demand for mental health care is known to be price sensitive, such that small increases in price make big differences in demand (Horgan, 1983; Taube, Kessler, & Burns, 1986; K. B. Wells, Keeler, & Manning, 1990). This has been thought to pose a barrier for persons without insurance especially given discrepant use among low income

groups and minority populations. However, research findings do not necessarily show that even in the presence of insurance those groups will use anymore care (Swatrz et al., 1998).

The demand for care is also responsive to price is because of cross-elasticity, or the availability of less costly substitutes, such as family, friends and community. Many consumers simply may have better alternatives to mental health care, but this does not explain why individuals would seek treatment to begin with. Economic research into non-compliance with drug therapies provides a helpful framework here. Knowledge on treatment compliance has been greatly advanced in pharmacoeconomics because researchers target the inferiority of the technology-not the patient. If patients are not happy with side effects, experience discomfort or suffer poor outcomes from drug compliance, then the drug-not the patient needs to change. Thus great strides have been made to improve compliance by reducing side effects and improving administration to facilitate greater patient compliance. These advances reduce the non-price costs of care borne by the patient which, in turn, seem to improve the patient's compliance with the treatment.

Patient valuations

Treatment noncompliance rates reflect patients' valuations of particular therapies (Ellickson et al., 1999). For patients, compliance is not an issue, they do not obey or disobey the doctor's orders (Donovan, 1995). Patient's choose to be noncompliant if the costs of compliance, such as increased frequency of complications or morbidities, outweigh the benefits in terms of improved quality of life. Patients make a personal tradeoff between efficacy of treatment and the side effects it generates (Cleemput et al.,

2002). Factors associated with compliance rates include the behavior changes recommended, complexity of the regimen, and ease to which the patient can incorporate the recommendations into their daily routine (Miller, Hill, Kottke, & Ockene, 1997). Patients' evaluations of the effectiveness of treatment and severity of side effects suggests patients respond to perceived costs, both monetary and psychic when choosing whether or not to comply, and even the long term health prospects resulting from complying often do not outweigh the more immediate concerns with side effects, inconvenience or discomfort (Ellickson et al., 1999).

This is related to the notion that individuals have a positive time preference, preferring money and resources now as opposed to later in order to benefit from them in the interim (Birks & Buurman, 1994; Drummond et al., 2000). Two of the most important patient and family resources needed to comply with treatment is time and money because of the high opportunity costs of both (Luce & Elixhauser, 1990; Ellickson et al., 1999). Opportunity costs are the value of foregone benefits when a resource is not available for its best use (Drummond et al., 2000). The impact of monetary costs in determining mental health utilization is well established, and can be evaluated directly by through insurance coverage, premiums and out-of-pocket payments. Time costs are not as well studied, except in terms of productivity (human capital) losses to society. However, among chronic mental health conditions, such as depression, an individual may not be in optimal health, but not impaired enough to stay home (Brouwer, Koopmanschap, & Rutten, 1999). Complying with complex treatments must then compete with time that would otherwise be devoted to wage earning (Singh et al., 2001).

Treating noncompliant patients is likely to be more costly than treating compliant patients, but the outcome of noncompliance for the patient is less certain (Giuffrida & Gravele, 1998). From the patient's perspective, noncompliance may temporarily improve quality of life as the individual deliberately adapts treatment to fit his own lifestyle, or it may decrease quality of life through reduced effectiveness and increased long term morbidity (Cleemput et al., 2002). Giuffrida and Gravele (1998) explain even a reduction in treatment effectiveness depends on the health gains that would have been derived from treatment; time and other costs resulting from compliance; and the patient's valuations of these gains and costs. Finally, from the societal perspective, untreated or partially treated mental illness resulting from noncompliance with treatment creates resource use in other sectors through time, financial, and emotional costs of caretaking by family and community, and such things as emergency housing, social services, legal services and law enforcement. The patient does not take these negative externalities into account in his decision not to comply (Cleemput et al., 2002).

Risk and Uncertainty

An individual knows best how improvements in health status affect his or her well being and his willingness to pay, but there is uncertainty regarding the diagnosis, treatment that may be needed and expected outcomes. Uncertainty affects the individual's expectations for health outcomes, beliefs about the adequacy of medical treatment, and the ability of the doctor to achieve those outcomes. Individuals evaluate uncertainty depending on preferences for, or willingness to bear risk. Risk aversion is the most common attitude toward risk- most individuals prefer a certain outcome to a risky outcome that probabilistically has the same expected value. Dardanoni and Wagstaff

(1990) describe two types of uncertainty. Type I uncertainty surrounds the individuals lack of diagnostic information to accurately assess his level of health and eventual health outcomes. Type II uncertainty surrounds the effectiveness of medical care. Uncertainty in medical care often results from asymmetric information which affects both patient and provider decision making. For example the patient, unlike his physician, has imperfect knowledge about the effectiveness of different types of medical care.

According to Lee (1995) a patient's willingness to comply with a treatment mainly stems from his own way of interpreting medical information that is often different from the doctor. A potential patient chooses a threshold health level such that he decides to consult a doctor only when his health falls below this level with the threshold health level determined by preferences, income, user price, and medical information. The more severe the illness, the lower the elasticity of demand for medical care (Lee, 1995). Crossing the doctor's threshold gives the patient a chance to obtain objective information about the pattern and magnitude of medical care needed for raising the health status. This information consists of diagnosis, and identification of the capacity, pattern and magnitude of the medical care needed to improve health status. Once the patient has obtained information about diagnosis and available treatment, there is still uncertainty around the capacity of medical care to improve health status, and a decision must be made about whether to accept the treatment.

Supply-side factors

While the patient lacks information about diagnosis, treatment and outcomes, the physician does not have perfect knowledge about the patient's personal objectives, attitude or ability to pay (Donovan, 1995; Lee, 1995; Ellickson et al., 1999; Frieman &

Zuvekas, 2000). Pauly (1980) points out the doctor may be well informed about the technology to improve health, but may be poorly informed about the patients demand for health and preferences for care. Physicians may be less sensitive than patients to the effects of treatment, opportunity costs and preferences for risk, and may underinvest in gathering the types of information about patients which yield the best fit. Patients are selected into treatments by their doctors, but doctors draw upon their own stock of knowledge and understanding when deciding upon a treatment regimen, and do not necessarily prescribe treatments in a neutral manner (Ellickson et al., 1999).

Freiman and Zuvekas (2000) explain that information asymmetry is particularly problematic in mental health. The accurate diagnosis and treatment of mental health problems relies heavily on the interaction between patient and provider. The provider may misperceive patient information inferred by descriptions of emotions, thoughts and events, and interpretation of voice and visual cues. Patients may differ in their ability to effectively communicate symptoms, and may misperceive their own mental state and symptoms. Providers respond to patient characteristics such as age, race/ethnicity, gender, and education when considering patient preferences and treatment outcomes. As a result, the provider may apply different norms in assessing symptoms of mental health problems according to the gender or ethnicity of the patient.

Technology influences

Medical technology, both its efficacy under ideal conditions and its adequacy in practice, effects decisions about compliance (Hummel, Rossum, & Verkerke, 2000). Health care is described as a set of technologies that probabilistically span zero to one. A better technology is one with a higher probability of choosing the correct diagnosis and

treatment, and that offers a greater chance of recovery for the patient (Leonard & Zivin, 2000). The effectiveness of mental health care is often complicated by known difficulties with the reliability of diagnoses, and frequent lack of consensus about etiology and treatment for many psychiatric illnesses. Treatments are sometimes compulsory, ill defined and many have not been proven effective (Evers, Van Wuk, & Ament, 1997).

Berndt, Bir, Busch, Frank and Normand (2000) estimate through expert panel testimony that 40 percent of medical treatment for acute stage depression involve treatments with little or no incremental effectiveness over waiting list. In an earlier paper, Berndt, Busch and Frank (1998) found all the major treatment technologies (including medication) for the average care of less severe acute stage depression offer comparable expected outcomes. This is not unique to mental health care. During the 1980's Rand Health Insurance Experiment, individuals with better insurance used more health care, but had health outcomes that were no better than those who used less care. Patients receiving over three times as much care were more likely to survive a hospital stay, but by nine months post discharge, both groups had the same mortality rate (Cutler, 1996). The implication is that about half of medical progress was directed at keeping patients alive for several months, but not for as long as a year. This is an argument about the diffusion of technology (Hummel et al., 2000). Technology that has diffused becomes widely overused. This includes use for those who would benefit a lot and those who would only benefit a little (Cutler, 1996). If treatments are applied to those who benefit a little and if patients do assess the treatment benefits in decisions about continuation, then the diffusion of treatment technologies could be a contributing factor to rates of noncompliance.

Compared to other medical treatments, the effectiveness of talk therapies is sometimes minimal, in that many conditions are not responsive to the available treatment, and unlike the rapidly advancing technology in other health sectors, the nature of talk therapy has simply not changed much over the years. This is puzzling, but may be related to the level of public protection granted to the mental health industry, and the resulting lack of market forces to reward innovation and improve technology. As discussed earlier in this paper, although there are strong societal preferences for access to mental health care, these do not seem to extend to maximizing treatment effectiveness. The societal costs of mental illness and market failure in the provision of mental health care has resulted in government regulation to ensure parity in insurance coverage; heavy subsidization of direct costs through the public sector; and, routine cross subsidization of operational costs from resource-generating departments to mental health units within health care organizations (Luce & Elixhauser, 1990). These actions ensure access, but may not provide adequate incentives to improve the effectiveness of treatments.

The ubiquitous nature of mental health problems and the broad impact on society makes the development of better diagnostic and treatment technology difficult. First, there is no finite criteria for defining mental illness in a way that clearly delineates the boundaries of what is and more critically what is not a mental health problem. Therefore, the scope of the illnesses that are diagnosable, and treated with the current technology continues to creep outward often following political and reimbursement paths. Second, although some mental health conditions, like depression, are thought to cause greater functional loss than many physical illnesses (Singh et al., 2001), mental health conditions are largely chronic, non-lethal, and even successful treatment is not likely to produce a

gain in terms of life years (Evers et al., 1997). Third, important costs resulting from mental illness are accrued outside the health sector, by family, community and public sector. Conditions such as schizophrenia and bipolar disorders are thought to have especially large impacts on both family and community (Tarricone et al., 2000).

Benefits of treatment

Nonetheless mental health care is presumed to have substantial benefits. According to Drummond (2000) there are three types benefits that can be derived from a health intervention: improvements in health status, saving of resources, and creation of other value. The first two are recognized benefits of mental health care, but are difficult to value. The third is both difficult to value and its benefits often overlooked. The most important outcome of changes in health status is the creation of healthy time. This is measured through changes in productivity and with the exception of severe mental illness, these improvements are gradient as discussed earlier. The second type of benefit is the saving of resources. This occurs when one intervention is equally effective as its alternative, but less costly. The third benefit, creation of other value, is thought to be a centrally important outcome of mental health care, but little is known about how much value patients, physicians, payers, and the public place on these intangible benefits.

Value may be created by a health care intervention, but not necessarily linked to an improvement in health state (Drummond et al., 2000). Intangible value is created when patients or caregivers place some importance on establishing a definitive diagnosis, independent of any effect the information has on treatment and clinical outcomes. Intangible value is created by the reduced uncertainty from obtaining information about underlying causes of symptoms, or future prognosis of an illness (Hirth et al., 2000). This

is interesting to note given the preponderance of early dropouts within the first month of mental health treatment (Miller et al., 1997). Perhaps the intangible value created from mental health care is satisfied independent of treatment, solely through diagnostic and assessment. Other value may be created for the family and community as well from the reduced uncertainty and reassurance that the patient is receiving appropriate health care.

Rebecca Blank (2000) points out one novel feature that uniquely characterizes mental health care is the reliance on "caring" behaviors. Providers of mental health care devote extensive treatment time to interactions that communicate a sense of trust and caring to the patient (listening, empathy), and this is a critical component of the patient-provider relationship. Patients may associate caring behaviors by the provider with higher quality services, but from a cost standpoint, caring is a very inefficient practice that creates higher than necessary labor costs for the minimal provision of services, and does not in itself produce tangible benefits or necessarily lead to better health outcomes. It may however, improve compliance by keeping the patient interested in treatment. The provider-patient relationship is, in fact, one of a strong predictors of satisfaction with care (Moller-Leimkuhler et al., 2002).

Economic research

Although it benefits from strong theoretical support treatment noncompliance is a relatively young research topic in economics (Hughes et al., 2001). As indicated earlier most of the research that has taken place has occurred through randomized clinical drug trials and through economic evaluations comparing the costs and benefits of competing drug therapies. In the latter, the effects of noncompliance are evaluated post hoc through a sensitivity analysis, in which sides of the both cost and benefit equation are

varied for differing assumptions about noncompliance rates (Drummond et al., 2000) In drug trials, compliance may be evaluated as an outcome of interest (Cleemput et al., 2002). Some researchers argue that the controlled conditions of clinical trials are ideal for examining noncompliance since all potential reasons for leaving the experiment, other than differences in the treatment themselves, have been neutralized by randomization (Phillipson & Hedges, 1998).

Patients have preferences that are revealed through economic choices, and choosing not to comply is such a choice (Phillipson & Hedges, 1998; Ellickson et al., 1999). These economic choices are thought to have high information value and, if accurately captured, could be helpful in reducing noncompliance. For example, several recent outcomes studies have been conducted which link patient preferences to the frequency and severity of key symptoms, adverse effects of treatment, and the impact of disease and treatment on daily life (Revicki, Leidy, Brennan-Diemer, Sorenson, & Togias, 1998; Ryan, 1999; Markson et al., 2001; McKenzie, Cairns, & Osman, 2001). These studies suggest methods which have potential for enriching our knowledge of the relationship between patient preferences for treatment and treatment compliance. Obtaining patient preferences for care however, is complex, and these studies are very new to the research. More commonly, the health care industry deemphasizes preferences for care in favor of patient satisfaction. Thus far, the notion of patient satisfaction has been somewhat implicit in the discussion of patient preferences, but a closer examination is needed to clarify the relationship. Although commonly used in health care, the question remains whether current measures of satisfaction will adequately reveal patient valuations which influence decisions about compliance.

There are two types of patient preferences: values and utilities, and the distinction is critical to informing measurement. As discussed utilities are preferences under conditions of uncertainty and are revealed through consumer behavior, such as treatment noncompliance (Drummond et al., 2000). Revealed preferences can be measured using willingness-to-pay, time-trade off, standard gamble and contingent valuation exercises which simulate uncertainty by introducing probabilities into decision making. For example, in a WTP exercise, the point of indifference between two probabilistic alternatives is used to obtain minimum amount an individual would pay rather than go without a treatment. There are several problems with using these exercises. The first is that the average person does explicitly consider probabilities which can make simulation of these exercises awkward. Second, individuals are accustomed to not paying for health care making it difficult for them to estimate what they would pay (Birks & Buurman, 1994). Finally, there are concerns that WTP estimates may be constrained by an individual's ability to pay, and valuations are therefore dependent on income distributions. (Drummond et al., 2000). However, at least one study has used WTP as a proxy for patient satisfaction (Schiffner, Brunnberg, Hohenleutner, Stolz, & Landthaler, 2002) finding that the more effective the treatment modality, the more the patient would be willing to pay.

Values are preferences under conditions of certainty elicited directly from consumers, and therefore called stated preferences. Stated preferences are commonly measured through scaling methods, such as rating, visual analogue and ratio scales. The patient satisfaction measure is a rating scale, but satisfaction measures suffer from several known shortcomings. Originating in business-not economics, satisfaction measures do not have a sound theoretical base, and by design, they ignore the notions of sacrifice and

opportunity costs (Vick & Scott, 1998; Scott et al., 2002). Although they elicit patients' experience of care, they do not directly ask about preferences for treatment, or assess attributes of illness that are most important to patients- which the literature suggests may be at the heart of patient decisions not to comply. Additionally, satisfaction data can be widely misunderstood and misrepresented as indicative of superior treatment impact or treatment efficacy (Lebow, 1982).

Conclusion

This section has described the conceptual framework for this dissertation research. Consumer demand for health care is derived from the demand for health. Utilization is based on consumer demand. Demand is responsive to cost, availability of substitutes and the utility gained from care. Utility operates within the constraints of household budget and is composed of patient preferences, including preferences for risk. Health care has costs and benefits beyond what the individual pays. These externalities are corrected through government intervention to subsidize direct costs and increase supply. This is an important concept in mental health care, where more care may be available than would be demanded in a purely market environment, but in a market environment, the care would be purchased only by consumers with more income.

Individuals with a mental health problem are often disabled and have low incomes, and these are exactly the persons often excluded in the marketplace. Although psychotherapy has treatment benefits for any individual with a mental health problem, consumers who are white, well educated and have high income seem to have a greater demand for it. Low income and minority consumers may be more interested in resolving basic problems of food, clothing, shelter, than receiving psychotherapy. Therefore, they

would be indifferent to being priced out of the market for outpatient care. Outpatient mental health care for this hard-to-reach population must be easily affordable and accessible. Even then, as mentioned above, if the product is wrong then demand will remain low. Many treatments are complex, time consuming and generate other indirect costs for the patient. Coupled with low demand, patients may find the cost to benefit ratio is too large, and simply drop out of treatment.

Economic theory provides compelling insight into the persistent problem of noncompliance with mental health psychological treatments. The role of patient preferences in treatment noncompliance, and noncompliance itself as utility maximizing economic behavior, has been examined in pharmacoeconomic research, is emerging in health care research, but has not received much consideration in mental health care. The notion raises questions about how to empirically evaluate the relationship between patient preferences and the resulting economic behavior. Satisfaction with care and treatment noncompliance are less than ideal proxies, but they do have the advantage of highlighting the important problem of treatment noncompliance in outpatient mental health care, and testing the adequacy of patient satisfaction measurement against the highly theoretical utility theory.

CHAPTER 3 Literature review

Gaps in Mental Health Research

If the problem of treatment noncompliance dropouts is as widespread and problematic as suggested, why hasn't the impact been previously recognized in the research? The answer lies in 1) the evolution of mental health utilization research and interplay over the years between research, policy and payers; 2) research design and sampling issues making treatment compliance difficult to study; and 3) perceptions by the mental health industry that the problem is systemic and intractable. The research community first became interested in mental health utilization after the 1977 President's Commission on Mental Health posed serious questions about the extent to which Americans with mental illness were being underserved. Deinstitutionalization in the 1970's had pushed thousands of mentally ill persons into the community, and from this influx of people needing services was the beginnings of the community mental health system.

The 1977 President's Commission resulted in funding for the Epidemiologic Catchment Area Study, the largest mental health epidemiologic survey in the U.S., which sought to estimate the incidence and prevalence of mental disorders (Regier, 1994). One powerful finding of the ECA was that the majority of persons with a mental disorder do not seek care (Shapiro et al., 1984). Raising public concerns about access to services, policy makers and the mental health community began to pressure the insurance industry to provide outpatient coverage to treat individuals with mental disorders. As tension grew, it generated interest among researchers regarding the effects of insurance

arrangements on mental health utilization. Fueling this research was the insurance industry itself, which historically believed talk therapies were not efficacious and necessitated greater price controls than other health benefits in order to discourage discretionary use.

Two questions have dominated the research on utilization since the 1980's. The first is whether the availability of health insurance increases demand for mental health care (Horgan, 1983; Keeler, Manning, & Wells, 1988; Zuvekas, Banthin, & Selden, 2001). This is an argument about parity and the insurance practice of providing less coverage for mental health than for other medical services. Several large studies on the effects of different insurance arrangements on demand for mental health were carried out with the most well known being the Rand Health Insurance Experiment (HIE) (Ware, Manning, Duan, & Wells, 1984; Diehr, Price, Williams, & Martin, 1986; Watts, Scheffler, & Jewell, 1986; Keeler et al., 1988; McGuire & Fairbank, 1988). The second question facing researchers is whether reducing incentives to discretionary use by increasing co-payments discourages persons with greatest need from seeking care (Ware et al., 1984; Taube et al., 1986; Landerman, Burns, Swartz, Wagner, & George, 1994; G. E. Simon, Grothaus, Durham, Vonkorff, & Pabiniak, 1996; Goldman & Smith, 2001). Coinciding with a shift in national health policy and concern about health care for the uninsured, the second question inspired another generation of utilization research that centers around identifying barriers that impede access to care (Horwitz, 1996; Katz et al., 1997; R. C. Kessler et al., 1997; Swartz et al., 1998; Hoff et al., 1999; Alpine & Mechanic, 2000).

Our understanding from 30 years of research is that mental health care is price sensitive, such that small increases in copayments result in large decreases in the probability of use, but that even in the presence of zero copayments and free care, many individuals with a mental health diagnosis will still not seek treatment. Studies have produced consistent information about who will and will not use the mental health care system, but have not adequately explored the question of why (Landerman et al., 1994; Swartz et al., 1998). What is evident from history is that it has never been the goal of utilization research to advance our knowledge in this direction. However, our preoccupation with improving access for those who will not seek care, and reducing access for those who will has shifted the attention further away from weaknesses in the design of the mental health care system itself. To predict who will leave and who will stay in therapy, researchers have focused on patient sociodemographic characteristics and disregarded the treatment process as an important predictor (Goldenberg, 2002). That we can so reliably predict utilization based on demographic factors gives reason to wonder if the population for which the mental health care system is intended is the same as the population who in reality use the mental health care system. It is evident that for older persons, African Americans, low income and less educated persons, the current outpatient mental health system may hold very little appeal.

A second reason for the gap in mental health research is related to sampling and design issues that make it difficult to study those who have used, but who terminate early from mental health care. There are three varieties of data collection commonly used in utilization research: 1) nationally representative samples from epidemiological studies such as the ECA (Landerman et al., 1994; Swartz et al., 1998), National Comorbidity

Survey (NCS)(R. C. Kessler et al., 1994; Katz et al., 1997; R. C. Kessler, Olfson, & Berglund, 1998; R. C. Kessler et al., 1999), National Medical Expenditure Survey (NMES) (Olfson & Pincus, 1994b; Frieman & Zuvekas, 2000) and the Medical Expenditure Panel Survey (MEPS) (Olfson et al., 2002); 2) less generalizable, but often large samples of clinical populations obtained from insurance records and patient databases (Hu, Snowden, Jerrell, & Nguyen, 1991; Flaskerud & Hu, 1992; Takeuchi et al., 1995; G. E. Simon et al., 1996; Hoff et al., 1999); and primary data produced from studies designed to investigate treatment dropouts (Pekarik, 1992; Wierzbicki & Pekarik, 1993; I. M. Anderson & Tomenson, 1995; Wang et al., 2000).

There are strengths and weaknesses to research from each data source. For example, large surveys can produce nationally representative estimates of mental health expenditures and utilization, and can be used to estimate demand for mental health care (health seeking behavior), but this tells us little about changes in demand that occur among persons who have had an initial contact (continuity). Large surveys provide equal access to both clinical (in treatment) and non clinical (no longer in treatment) populations, but knowing how many entered care and how long they stayed, reveals little about the conditions under which they left. Researchers must rely on 'level of use' as an imperfect proxy to distinguish those who terminate care as dropouts from those terminate care as completers (Lebow, 1982; Pekarik, 1992). More specifically, those who improve spontaneously with consultation from those who receive treatment (Olfson & Pincus, 1994b; Berndt et al., 1998); and among those who received treatment those who completed and those who dropped out early (Whynes, 1993; Berndt et al., 2000).

With the second variety of research there is the opposite problem. Database records can be used to discern treatment completers from dropouts, but researchers do not exploit the data to investigate of the problem or its implications for the cost effectiveness of outpatient treatments. Data from patient records provide better exit data on patients, but almost universally the patients themselves are censored once they terminate, excluding them from further study and biasing research findings toward completers. Researchers have recognized this weakness, but complain of grave difficulty contacting patients once they have terminated (Pekarik, 1992). Finally, studies using clinical databases do not give adequate consideration- and few give any consideration- to the treatment process and differential preferences for treatment as a possible predictor of treatment dropout. There are exceptions, such as a study by Goldenberg (2002) where researchers differentiated medication from non-medication visits as predictors of treatment dropout. Similarly, in a study by Takeuchi, et.al., (1995) researchers found treatment setting as a predictor of number of visits to be significant with fewer minority patients in ethnicity-specific treatment settings terminated treatment early.

The third variety of research comes from observational studies of clinical populations. These involve some combination of patient survey and retrospective chart review in which researchers can tailor the research design to collecting the right variables and countering nonresponse of dropouts (Cuffe, Waller, Cuccaro, Pumariega, & Garrison, 1995; Grunebaum et al., 1996). For example, Pekarik (1992) sampled 100 treatment dropouts specifically investigating reasons for terminating care. Halweg & Klann(1997) evaluated attrition in 495 marital therapy cases. Kendall & Sugarman (1997) evaluated predictors of attrition in an anxiety disorder clinic. Wang, et al. (2000)

conducted a cross-sectional mail survey of 3,516 respondents from 14 patients advocacy groups in 11 countries asking whether patients initiated and adhered to mental health treatments recommended to them. Centorrino et al. (2001) in a study of patients with missed appointments found treatment type to be significant predictor of noncompliance with medication patients having higher rates of missed appointments than psychotherapy patients. Mueller & Pekarik (2000) conducted a prospective study examining the accuracy of client and clinician predictors of dropout.

Well designed clinic-based observational studies on noncompliance are infrequent, and do not produce generalizable findings because of small sample sizes and lack of random selection. Randomized clinical trials that use treatment dropout as an outcome and compare differences in the effectiveness of treatments are more desirable, but are rarely used in the study of psychological treatments (Miller et al., 1997). One exception is a randomized controlled trial by Hamilton, Round, & Sharp (1999) comparing rates of missed appointments among outpatients who were sent appointment reminder letters. Killapsy et al. (2000) conducted a prospective controlled study at a London outpatient psychiatric clinic, but only patient factors were considered as predictors of missed appointments. Randomized clinical trials occur more frequently in mental health drug treatment studies. For example, in a recent study by Tai-Seale, Croghan, & Obenchein (2000), researchers use noncompliance rates as a measure of treatment effectiveness between tricyclic antidepressants and selective serotonin reuptake inhibitors.

Patterns of care in mental health

A major concern with effectively addressing the problem of treatment dropouts is that the mental health community may be uninformed about the extent of the problem, or may interpret noncompliance as part of the burden of illness. Researchers have questioned the ability of mental health patients to rationally evaluate decisions about compliance because of impairments in cognitive and emotional functioning (Hoff et al., 1999). Pescosolido & Boyer (1999) state "the very nature of mental illness calls into question the individual's ability to engage in the complicated cognitive processes on which some [utilization] theories rely" (p. 404). Researchers have also questioned whether patients with mental illness are able to objectively formulate evaluations regarding satisfaction with care (Hoff et al., 1999). Marshall et al (1996) question the assertion that dissatisfaction may be a manifestation of psychological distress or general life dissatisfaction. They found that psychological well being accounts for as little as 10-15 percent of the variability in general satisfaction ratings.

Failure to recognize the nature and extent of treatment noncompliance may be due to asymmetric information qualities inherent in the provider-patient relationship. According to a 1992 quote by Hurley, Birch and Eyles "... while the health care provider possesses better knowledge regarding the expected effectiveness of health care in improving health status, the individual knows best how improvements in health status affect his or her well being. Technical knowledge resides in one party while preferences reside in the other" (Charles et al., 1997) (p. 683). Patients do not choose-but are expected to comply with-treatments they have been selected into by their providers. A recent study by Dwight-Johnson, Unutzer, Sherbourne, Tang, & Wells (2001) found in a sample of depressed patients wanting treatment, many did not get the treatment they preferred.

Providers draw upon their own stock of knowledge in prescribing treatments and do not necessarily act neutrally in these practices (Donovan, 1995; Lee, 1995; Ellickson et al., 1999). Such were the findings in a study comparing patient preferences for psychotropic medication and specialty mental health care. Frieman & Zuvekas (2000) found providers suggest treatments in part on the basis of their perceptions of patient characteristics.

An even simpler explanation, supporting the notion that the professional community may be unaware of the extent of the problem, is suggested by Howard et al. (1989). They describe a phenomenon called the clinician's illusion which occurs because, although the majority of patients attend relatively few sessions, the majority of provider time is spent with a small number of long term patients. This creates an unrepresentative impression on the provider about the population. The authors found support for this theory in a study of 405 long term psychotherapy patients. Sixty-eight percent of patients attended fewer than 27 sessions, but accounted for only 23.3% of the total sessions. Thirty-two percent attended more than 26 sessions, and accounted for 77 percent of the total number of sessions used. In their research using 230 private practice patients, Mueller & Pekarik (2000) found therapists to be poor predictors of duration of care expecting a far greater number of sessions than actually occurred. These finding were similarly reported by Swain-Campbell, Surgenor, & Snell (2001) in research on eating disorder patients. In a study by Olfson & Pincus (1994a), researchers used NMES data to identify patterns of utilization among psychotherapy users. With number of visits divided into very short term: 1-2 sessions, short term: 3-10 sessions, intermediate: 11-20 sessions and long term: more than 20 sessions, they found that long term psychotherapy users accounted for only 15.9 percent of psychotherapy users, but 62.9 percent of psychotherapy

expenditures. A more recent study by Goldenberg (2002) of 2,889 patients who either completed or dropped out of treatment, found that one quarter of clients received between one and four sessions, half received between five and 26 sessions and 25 percent received more than 26 sessions.

The literature suggests almost 50 percent of people making a mental health visits make five or fewer visits (Howard et al., 1989). However, clinical practice guidelines for treatment of acute phase depression do not indicate any demonstrated effectiveness in fewer than six visits (Berndt et al., 1998). Wang et al. (2000) reports fewer than half of patients have been found to continue treatment for adequate duration. Kendall and Sugarman (1997) report 23 percent of therapy clients dropped out after the first session and almost 70 percent terminate before the 10th session. Garfield (1994) reports from investigations conducted over several decades in diverse clinical settings, that the majority of clinics lost half of their clients before the eighth sessions, with a range of three to 13 and a cluster around six. Reports of the average number of visits ranges from 13 visits reported by Howard (1989) to more recent estimates of 8.7 visits reported by Olfson et al. (2002). The few studies that have gone beyond number of visits to compare dropouts and completers have reported that outcome is the key difference. Goldenberg (2002) found treatment outcome to be the strongest correlate in number of visits, with completers showing greater improvement and dropouts citing lack of improvement as the reason for dropping out. Wang et al. (2000) found lifetime dropout rates due to side effects and treatment ineffectiveness to be 44 percent. Noncompliance rates do not appear to be constant over the course of treatment. Miller et al. (1997) reports compliance during the first month is the best predictor of long term compliance. The

greatest proportion of patients discontinue therapy early after treatment initiation rather than in subsequent months or years (Hughes et al., 2001). Lee (1995) explains this process: Patients go to the doctor to gain information about the pattern and quantity of medical care needed for health improvement. Crossing the doctor's threshold gives the patient a chance to obtain objective information about the care needed, but the health outcome is still conditional on the patient's health status and the patient's perception of the effectiveness of medical care.

Underlying much of the research is the implication that person-centered barriers, both exogenous i.e., insurance, income, and endogenous i.e., race, age, perceived need, are the best predictors of utilization for those who under-use and overuse the mental health system (Howard, 1996; Killapsy et al., 2000). Although it creates a situation where the patient's response to the mental health care system is seen as outside the responsibility of the professional community, patient sociodemographic characteristics, such as race/ethnicity, age, gender, income and education, can alos provide the most compelling evidence for the influence of patient preferences on low rates of treatment and treatment noncompliance. This section highlights patient factors that have been associated with level of use, treatment noncompliance, and patient satisfaction in mental health care.

Patient characteristics

Ethnicity

The strongest evidence of differential preferences for mental health care is by ethnic group where, although prevalence of mental disorders vary, rates of outpatient use are

consistently low compared to whites (Hu et al., 1991; Flaskerud & Hu, 1992; Wierzbicki & Pekarik, 1993; Grunebaum et al., 1996; Swartz et al., 1998; L. Cooper-Patrick et al., 1999), and this pattern has not changed over time (Zuvekas, 2001). This is particularly evident with African Americans, who are thought to have rates of disorder similar to that of whites, be disproportionately represented among the seriously mentally ill, but have rates of outpatient use far below that of whites, even in the presence of insurance (Swartz et al., 1998; Alpine & Mechanic, 2000). Research reveals African Americans tend to have greater substitutions for care such as family, social support and spirituality (Cuffe et al., 1995), and as a group endorse greater concerns about stigma of mental health care (Cuffe et al., 1995; Millett, Sullivan, Scwebal, & Myers, 1996; L. Cooper-Patrick et al., 1997). Stigma is a not often considered intangible cost of mental health care.

Horwitz (1996) reports ethnicity is strongly related to both entry and retention in mental health treatment. In a longitudinal study of psychiatric disorders, Cuffe et al. (1995) examined race as a factor in the referrals of 478 adolescents. They found Caucasian patients twice as likely to stay in treatment past two visits than African American patients. Zuvekas (2001) reports although whites are still more likely to use MH/SA services, rates of treatment between 1987-1996 grew in same proportions for whites, African Americans and Hispanics. Hu et al. (1991) report from a large study of the public mental health system in two California counties, that African Americans used more emergency and less outpatient care. Olfson & Pincus (1994b) found that nine out of ten psychotherapy users were white. In a meta-analysis of 125 psychotherapy studies

Wierzbicki & Pekarik (1993) found African Americans and other minorities to have an increased risk of dropping out of psychotherapy.

Frieman & Zuvekas (2000) in a study comparing patient preferences for specialty mental health care and psychotropic medications found that, relative to whites, other ethnic groups were less likely to have either type of treatment, but being black decreased the probability more-especially for receiving specialty care. Zuvekas (2001) also found African Americans were also less likely to use psychotropic medication. Hoff et al. (1999) found Caucasian patients having higher patient satisfaction ratings compared to African American patients. Wells, Klap, Koike and Sherbourne (2001) have found both low rates of treatment and low satisfaction among Hispanics. In a 1995 study of 5,000 African Americans, Mexican and Asian Americans in treatment, Takeuchi et al. (1995) found that all ethnic groups in ethnicity-specific programs were more likely to return after one visit and had longer lengths of treatment.

Gender and age

Research has linked gender and age to patterns of mental health utilization. Females are more likely to use outpatient mental health care (Horgan, 1983; K. Wells, Manning, Duan, Newhouse, & Ware, 1986; Landerman et al., 1994; Olfson & Pincus, 1994b; Horwitz, 1996; Hendryx, 2001; Zuvekas, 2001). Frieman & Zuvekas (2000) report probability of females receiving both specialty care and psychotropic drugs to be 1.5 and 2.5 percentage points respectively higher than for males. Swartz et al.(1998) report the odds of use in the public sector is higher for males. From the ECA study males were more likely to visit a specialist (Shapiro et al., 1984). Few studies have been done linking

age and gender specifically to treatment noncompliance or satisfaction with care (Wierzbicki & Pekarik, 1993; Hoff et al., 1999; Fontana & Rosenheck, 2001). However, Wang et al.(2000) found that being male increased the odds of treatment compliance. Frieman & Zuvekas (2000) found significant differences between males and females in their preferences for specialty care and medication. Hoff et al (1999) reports males to be more satisfied with care, but the sample was drawn from a predominately male population.

Using NCS data to estimate lifetime and 12 month prevalence of mental disorders R. Kessler et al. (1994) found the highest prevalence of disorder occur in 25-34 year olds with prevalence declining thereafter. Horwitz (1996) in his literature review on help-seeking concluded that age was strongly related to mental health use with the elderly being particularly reluctant to enter care. The odds of public sector use is nearly six times less likely among oldest versus youngest cohort (Swartz et al., 1998). Low rates of treatment among the elderly may be due to lower rates of disorder, higher rates of institutionalization and poor mental health coverage among Medicare benefits (Swartz et al., 1998; Zuvekas, 2001). Being over the age of 65, decreases the likelihood of receiving long term psychotherapy while the 35-49 age group are more likely to use psychotherapy (Olfson & Pincus, 1994b). Being older is associated with greater satisfaction with mental health care (Hoff et al., 1999; Fontana & Rosenheck, 2001).

Education and income

Higher levels of education are associated with increased mental health use and adherence to treatment. Greater education is associated with increased probability of

seeing a mental health specialist (Ware et al., 1984; Frieman & Zuvekas, 2000) andreceiving medication (Frieman & Zuvekas, 2000). Diehr et al. (1986) and Mueller & Pekarik (2000) reported higher education is associated with number of visits. Olfson & Pincus (1994a) found having less than 12 years of education decreased the likelihood of receiving long term psychotherapy. Less education is also associated with higher rates of dropout (Wierzbicki & Pekarik, 1993) and more education associated with greater adherence to treatment (Centorrino et al., 2001). Education effects appear to be much greater in predicting mental health use than income effects and, in some cases, even insurance effects (Swartz et al., 1998). This is consistent with the health capital model which purports individuals with more education may have a higher value for health and use more health care inputs (Grossman, 1972).

Taube et al., (1986) reports income, education and insurance coverage interact to produce different demand elasticities across income groups. For example, those with less income are also less likely to have insurance required to access mental health care (Shi, 2001). Monheit, Vistnes, & Zuvekas (2001) disagree finding individuals in the lowest income groups have greater stability in their public insurance coverage than any other income group except high income. Individuals who are near poor, without Medicaid, and whose household income is 150 percent of the poverty level are at higher risk than other income groups for having mental health service needs unmet (Klerman, Olfson, Leon, & Weissman, 1992). Hendryx (2001) found higher income associated with a greater number of mental health visits. Others have found no direct relationship between income and utilization (Horwitz, 1996). Olfson and Pincus (1994a) found income only weakly related to psychotherapy use with poor or near-poor receiving long term psychotherapy in

proportion to their numbers in the general population. Flaskerud & Hu (1992) report patients in lower SES receive less treatment, but earlier studies showed lower SES to be a significant predictor of at least one visit (Diehr et al., 1986). Wierzbicki and Pekarik (1993) report drop out rates increase for lower income groups. Hoff et al.(1999) found high income associated with greater satisfaction.

Insurance

The amount of insurance coverage is a major factor in the use of mental health services (Goodman, 1989; K. B. Wells et al., 1990; Landerman et al., 1994). Horgan (1983), Keeler (1988) and Taube (1986) report cost sharing influences the demand for mental health care, but the decision to use services is affected differently than level of use. For example, a study by Simon, Grothaus, Durham, Vonkorff and Pabiniak (1996) estimated that instituting a $20 co-payment can have a 16 percent reduction in the likelihood of use, and $30 co-payment can decrease visits by nine percent. Recent changes in the payment structure of insurance has also dramatically influenced use. According to Zuvekas (2001), by the 1990's three fourths of insured Americans had their MH/SA services managed under managed carve-out plans. McGuire and Fairbank (1988) the HMO effect on mental health care is primarily on visits per user rather than on the number of users. Rosenthal (2000) estimates under capitated plans, fixed payments to providers for cases has reduced the number of visits by 20-25 percent.

There have been concerns about whether higher insurance co-payments produce more barriers to mental health care for those with the greatest need. Using findings from the HIE, Ware et al. (1984) rejected insurance as a factor for those with greatest need

not receiving care. They found among persons under the free care plan, the most psychologically distressed still had only a one in five chance of receiving outpatient mental health care. Horwitz (1996) also found that out-of-pocket costs of mental health care have a strong impact on use regardless of clinical need. However, Landerman et al. (1994) found the effect of insurance coverage on the probability of a visit was stronger among those with a diagnosis. There are no studies which estimate the effects of co-payments on the decision to terminate care prematurely, although there likely to be a connection given that the strongest insurance effects seem to be on number of visits. There is no data on insurance coverage and satisfaction with care, although it is reasonable to expect patients with more generous insurance benefits may be more satisfied with their health care. Insurance could also follow other socioeconomic factors that have been linked to satisfaction, such as income and age.

Health Status

Outpatient mental health use is common among individuals in poor health and with functional impairments due to chronic disease (Olfson & Pincus, 1994b). Diehr et al., (1986) found poor health and lower SES was correlated with having at least one mental health visit, but better health and higher SES was correlated with a higher quantity of use for those who had some use. Olfson & Pincus (1994a) found poor or fair health status was associated with long term psychotherapy use. Horgan (1983) reports neither perceived health status nor disability days were significantly related to number of visits. Health status and mental health status may have a different effect on compliance than patient sociodemographic factors. Patient preferences may play a greater role on decisions to comply with care, but health status could be a more important factor in the

initial decision to seek care (Lee, 1995). In a study of 114 rheumatology patients Hall, Milburn, Roter, & Daltroy (1998) found less healthy patients tend to be less satisfied with their care. Hoff et al. (1999) also found persons with lower health ratings had lower satisfaction ratings. Marshall et al. (1996) found no significant links between general satisfaction with care and physical health status.

Diagnosis/Mental health status

Research findings suggest mental health status is a major predictor in both probability and intensity of outpatient mental health treatment (Ware et al., 1984; Olfson & Pincus, 1994a; Hoff et al., 1999; R. C. Kessler et al., 1999; Frieman & Zuvekas, 2000; Killapsy et al., 2000; Centorrino et al., 2001). The presence of a psychiatric disorder seems to be the strongest predictor of probability of use (Katz et al., 1997; Swartz et al., 1998; L. Cooper-Patrick et al., 1999), and level of use (L. G. Kessler, Steinwachs, & Hankin, 1980; Flaskerud & Hu, 1992; Landerman et al., 1994). Landerman et al. (1994) estimates from ECA data that those with a diagnosis are six times as likely as others to obtain care. Flaskerud & Hu (1992) found diagnosis to be significantly related to number of sessions.

Goldenberg (2002) reports a weak association between diagnosis and number of non-medication visits. Alpine and Mechanic (2000) report the number of outpatient visits varies little across disorders, even for persons with serious mental illness. Katz et al. (1997) found the prevalence of perceived need for mental health care is consistently higher in the U.S. than in Canada, but R. C. Kessler et al.(1997) found differences in the probability of obtaining care in the U.S. compared to Canada was confined to those with less severe mental illness. Some researchers have found patients who are more acutely ill

at the time they seek treatment are more compliant than those chronically ill or in partial remission (Centorrino et al., 2001). Killapsy et al. (2000) reports that patients who miss appointments are more unwell and more socially impaired. Grunebaum et al.(1996) suggests patients with mild distress and those with significant resistance to seeing a psychiatrist were more likely to miss appointments. Hoff et al. (1999) found patients with a mental health diagnosis to have lower satisfaction ratings for both mental health and heath care.

While there is a dearth of research that investigates the role of patient characteristics in determining utilization, there is an absence of research that investigates the role of patient preferences in determining treatment dropouts. Patient preferences for treatment have been studied in the context of patient satisfaction and patient satisfaction has been viewed as a desirable outcome of treatment (Ware, 1997). There are several problems with the conceptualization of patient satisfaction and an entire section is devoted to a review of measurement issues. However, relative to gaps in the research, it is important to note that of the studies conducted patient characteristics such as health status and diagnosis are most often employed to predict patient satisfaction (Marshall et al., 1996; Halweg & Klann, 1997; Hall et al., 1998; Lambert et al., 1998; Hoff et al., 1999). In a study of 3,600 veterans being treated for PTSD, Fontana & Rosenheck (2001) found patient characteristics outweighed treatment structure and treatment effectiveness in determining satisfaction, but treatment structure was defined as waiting time to admission and length of stay.

The relationship between satisfaction with care and treatment outcomes has been investigated in several correlational studies (Baronet & Gerber, 1997; Lambert et al., 1998; Pekarik & Guidry, 1999; Markson et al., 2001). Only Pekarik (1992), Brannan (1996) and Mueller & Pekarik (2000) have examined satisfaction as a predictor of treatment duration. Several interesting non-mental health studies have examined satisfaction in terms of patient preferences. Schiffner et al. (2002) used utility measures, willingness-to-pay and time trade-off exercises, as proxies for satisfaction with treatment modality. Scott et al. (2002) evaluated patient preferences for out-of-hours care using a series of discrete choice experiments. These did not examine effects of preferences on duration of care. Few mental health studies to date have used national probability survey data to examine patient satisfaction. The MEPS devotes an entire interview supplement to access, quality and satisfaction with care.

Taken together the literature suggests some patients are reluctant to utilize the mental health care system. This flies in the face of what is known about the prevalence of mental disorders and perceived need for care among individuals with a mental disorder. Patients who use and do not use the mental health system stand out by sociodemographic characteristics such as age, gender, race, insurance, education. This research seeks support for the hypothesis that although patients may face personal and environmental constraints in their decisions about health care, the widespread persistence and prevalence of high rates of treatment noncompliance suggests patients may be responding to factors within the care system itself in their decision to follow through with treatment. Instruments which measure patient satisfaction with care should offer some glimmer of information about patient valuations of these system factors. The

following section provides a review of the patient satisfaction literature to evaluate current trends in patient satisfaction measurement and explore issues of measurement design, validity and reliability.

Understanding Patient Satisfaction

Several concerns exist with regard to patient satisfaction measures. A critical review of the literature reveals two gaps: wrong population and wrong measure. Responses are universally skewed toward high satisfaction (Pollack & Wachter, 1975; Carr-Hill, 1992; Plante et al., 1998). According to Fornell & Johnson (1993) taken alone the negative skewness means little since it could imply that people buy what they like, and if they don't like what they bought they will not buy it again. They suggest this could be interpreted as an indicator of economic health since it means consumers have choices. However, if the diminishing rates of follow-up visits can be equated to repurchase behavior then it lends greater support to the argument that many patients do not like what they bought, and that current study design may only be reaching the patients who did. The population of treatment dropouts- those whose experiences and preferences we most need to understand - have proven to be elusive. This section provides a comprehensive review of the satisfaction literature with two goals in mind. First, two explore the complexity of patient satisfaction measurement and second to describe the content and structure of existing empirically tested instruments.

The two most common validity problems in satisfaction measurement are selection bias and acquiescence. These problems result in high undifferentiated levels of satisfaction that produce no systematic variance and make it difficult to distinguish between levels of satisfaction (Hudak & Wright, 2000). Selection bias, as illustrated in the paragraph above, refers to having derived data from a non-representative sample, and according to Lebow (1982), Pekarik (1992) and Marshall et al. (1996) is one of the most

serious threats. In outpatient mental health settings where treatments extend over time, dissatisfied patients are more likely to withdraw from treatment early, resulting in an over-representative sample of patients who on average have better outcomes and are more satisfied.

Inadequate research design can contribute to selection bias (Carr-Hill, 1992). The most frequently occurring design flaw is timing of data collection. In a study by Pekarik & Guidry (1999) researchers called for instruments to be administered at four and eight months after intake, which is well beyond the point when most patients drop out. Brannan et al. (1996) administered study instruments only to clients receiving services longer than one month. In a study on satisfaction and treatment outcomes Plante et al. (1998) report that many patients terminated before three month and six month measures could be administered. In research by Halweg & Klann (1997) where satisfaction measures were to be administered three and six months, 49 percent of the sample had terminated by the six month data collection point. How much of a sampling frame is lost to dropout is difficult to estimate because researchers do not uniformly report attrition rates in research findings. There are exceptions such as a study by Pekarik & Guidry (1999) where researchers reported that from a sample of 160 private practice patients, data was collected on only 93 patients due to attrition. Addressing systematic differences in the populations that may have influenced findings is even more important, but rarely occurs in satisfaction research (Nabati, Shea, McBride, Gavin, & Bauer, 1998).

A second validity problem with satisfaction measures is acquiescence, or the tendency of respondents to agree with statements of opinion regardless of content.

(Hudak, 2000). In his early research on patient satisfaction measurement, Ware (1997) found 10 percent of clients were totally acquiescent in surveys and another 40 percent were at least somewhat acquiescent. Single item satisfaction measures and measures containing all favorably or unfavorably worded questions are most biased toward acquiescence (Hudak & Wright, 2000). Avis et al. (1997) found that asking patients about their overall satisfaction often results in positive replies, whereas specific questions about the actual processes of care elicit a critical response. Markson et al. (2001) in their research on satisfaction with asthma treatments found by framing the questions in terms of dissatisfaction: "Are you dissatisfied with any aspect of your asthma treatment?" they could detect far more variance in patient responses. In fact, in this cross-sectional study of 5,181 asthma patients, 30 percent indicated dissatisfaction with their treatment.

The construct validity of patient satisfaction measures has been particularly difficult to establish. Researchers report that items on patient satisfaction questionnaires often represent important dimensions from the researchers' perspective but may lead to inflated reports of high satisfaction from the patients' perspective (Baronet & Gerber, 1997; L. Cooper-Patrick et al., 1997). Avis et al. (1997) explain that the use of open-ended questions and semi-structured interviews in satisfaction research prevents eliciting answers that only reflect providers' assumptions about what is important to patients. Since the content of measures discriminating satisfaction from dissatisfaction has not been established, and existing constructs have been questioned, some researchers have selected a qualitative research design. For example, Cooper-Patrick et al. (1997) conducted focus groups with African American and white patients to explore differences in help seeking, treatment preferences and perceived barriers to mental health care.

Baronet & Gerber (1997) used a combination of survey and open-ended questions on their research with community crisis center clients. Another reason for choosing a qualitative component is to evaluate the concurrent validity of standardized instruments. Williams et al. (1998) used unstructured interviews to validate the Client Satisfaction Questionnaire (CSQ-18b) finding expressions of satisfaction on the CSQ-18b hid a variety of negative expressions that were present during the interviews.

Lebow (1982), Carr-Hill (1992), Pekarik and Guidry (1999) and Markson et al. (2001) suggest the problem is that patients may have difficulty expressing dissatisfaction. The infrequency of ill health gives patients limited experience from which to evaluate quality of treatment and outcomes (Johnson, Nader, & Fornell, 1996). Uncertainty, risk and asymmetric information surrounding the diagnosis, treatment and prognosis of medical problems makes evaluating satisfaction especially complex for the patient. Contrasting with other service industries, the patient is an integral part of the 'production process' in health care. They may have difficulty separating their contribution to a health care intervention from that of the provider (Arrow, 1963; Fornell & Johnson, 1993; Bearden, Malhoyta, & Uscategui, 1998), and may even blame themselves for failure to achieve hoped for outcomes (Avis et al., 1997). Health care is a continuously provided service, of which a distinctive feature is that, upon entering into a relationship with the provider, the patient consumes or uses the service either continuously or intermittently over an extended period. The extent to which patient satisfaction with care that occurred over an extended period converges with satisfaction from a specific medical encounter is an important distinction having important implications for measurement, but which has not

been clearly evaluated in health care research (Marshall, Hays, Sherbourne, & Wells, 1993; Rao et al., 2000).

The role of expectations in how patients formulate satisfaction evaluations has been researched extensively in marketing science, and no fewer than ten major conceptual models have been produced and tested internationally. Suffice it to say expectations play an important role in the evaluation of any product or service, and in health care have been linked both to satisfaction (Williams et al., 1998) and number of visits (Mueller & Pekarik, 2000; Rao et al., 2000). The exact nature of the relationship is less clear. For example Williams et al. (1998) finds little consistent empirical evidence that fulfillment of expectations necessarily results in satisfaction. According to Cuffe et al. (1995) 'expectation' is a latent construct that is contextually derived. It must be defined within a given context before it is suitable for measurement. Rust, Inman, Jia, & Zahorik (1999) explain that expectations are derived from another latent construct: uncertainty, and uncertainty depends on the amount of experience a consumer has had with a product or service. Nonetheless there are practical concerns for the effects of general pessimism, optimism on expectations and responses to questions about satisfaction with care. This is a particularly important for the mental health population in which some believe negativity, pessimism and irrational thinking invalidates satisfaction measures altogether.

Patient satisfaction studies in health care have sought to identify illness factors that predict satisfaction with care, such as chronic illness, mental health status and diagnosis (Marshall et al., 1996; Atkinson & Caldwell, 1997; Hall et al., 1998; Hoff et al., 1999; Healey, Mirandola, Ammaddeo, Bonizzato, & Tanzella, 2000). Researchers have

conceptualized satisfaction as itself a treatment outcome (Ankuta & Abeles, 1993; Marshall et al., 1993; Pekarik & Wolff, 1996; Ware, 1997; Lambert et al., 1998; Plante et al., 1998; Pekarik & Guidry, 1999), but there is an inherent danger. By conceptualizing satisfaction as an outcome, researchers have created satisfaction measures that measure outcomes not satisfaction, such as a study by Ankuta & Abeles (1993). Their measure of satisfaction consisted of four questions from the Strupp Post Therapy Client Questionnaire. Three questions were related to benefit from therapy and amount of change: 'benefit from therapy', 'perceived amount of change' and 'perceived current functioning'. 'Satisfaction with therapy' was the only satisfaction question. It is no surprise that researchers found a relationship between clinically significant change and greater satisfaction. Researchers have reported satisfaction measures do a very poor job of measuring outcomes finding that satisfaction and treatment outcomes are distinctly separate constructs that do not even co-vary (Ankuta & Abeles, 1993; Landerman et al., 1994; Lambert et al., 1998). Barker & Orrell (1999) report that, although patient satisfaction has been employed as both a predictor and an outcome in the research, its value resides as a predictor variable in its influence on outcomes such as compliance. Despite its theoretical support, far less research has been conducted using satisfaction as a predictor.

A link between patient satisfaction and compliance has been suggested in several studies (Lebow, 1982; Cramer & Rosenheck, 1998; Barker & Orrell, 1999; Rao et al., 2000). Pekarik (1992) examined satisfaction among treatment dropouts reporting that dissatisfaction was greatest among unimproved dropouts. Nabati et al. (1998) tested the relationship between low satisfaction scores and treatment dropout finding no

association, but the study focus was on psychometric properties of the satisfaction measure with satisfaction hypothesized as a unidimensional construct. Sherbourne et al. (1992) used data from the Medical Outcomes Study to assess the relationship between adherence and satisfaction among chronically ill patients finding satisfaction with financial and interpersonal aspects of care were better predictors of adherence than satisfaction with technical aspects of care. In a study of eating disorder patients, Swain-Campbell et al. (2001) found treatment type to be the largest source of dissatisfaction and incongruencies between clinician and patient expectations to be an important cause of premature treatment dropout. Satisfaction with care has been used in many mental health studies where satisfaction itself is not the primary variable of interest. Measured using a single global question, these reveal little variation in satisfaction (Pollack & Wachter, 1975; Ankuta & Abeles, 1993; Pekarik & Wolff, 1996; Mueller & Pekarik, 2000).

Satisfaction studies in mental health have focused on the development and validation of instruments to identify the best structure (Marshall et al., 1993; Brannan et al., 1996; Avis et al., 1997; McKinley, Manku-Scott, Hastings, French, & Baker, 1997; Nabati et al., 1998; Barker & Orrell, 1999; Moller-Leimkuhler et al., 2002) and content (Marshall et al., 1993; Landerman et al., 1994; Brannan et al., 1996; Ware, 1997; Lambert et al., 1998). Of 14 studies reviewed 13 were devoted to instrument development. What follows is a review of major studies that address the content validity and performance of previously used measures. The purpose of providing this review is to guide measure selection for this study. There are two major objectives: The first is to identify the content of satisfaction measures which have generated the most empirical support. The second is to

determine whether to combine multiple satisfaction questions into a single unidimensional measure.

Unidimensional

Unidimensional measures hypothesize patient satisfaction as a single construct. There have been two basics strategies in the research: survey questions about global perceptions of care, and questions about multiple domain-specific aspects of care that are then summarized to represent overall satisfaction (Marshall et al., 1993). Global satisfaction questions have been found to be less valid than questions about distinct dimensions of care (Carr-Hill, 1992; Pekarik & Wolff, 1996; Baronet & Gerber, 1997; Meredith, Orlando, Humphrey, Camp, & Sherbourne, 2001). However, Pekarik (1992) used a single global question "In general, how satisfied are you with the services received?" measured on a four point scale to lend support for the hypothesis that treatment dropouts are not a homogeneous group. Using this unidimensional measure researchers found client satisfaction differed significantly among three groups of dropouts. Although high in face validity, directness and ease of administration, global questions increase the likelihood of high undifferentiated patient responses, and even if they produce enough variability to warrant additional statistical testing, they do not reveal what aspects of the care resulted in satisfaction- and more importantly dissatisfaction.

Combining multidimensional items into a single index of satisfaction has been criticized. The decision is often based on how hypothesized dimensions of satisfaction factor together. When items are submitted to a principal component analysis, there is

sometimes only one dominant factor that accounts for the greatest amount of variance in patient response. Researchers may decide to retain only these items combining them to produce a single dimension. (Marshall et al., 1993) found aggregated indexes to be more reliable than the individual items that compose them and less sensitive to method error. Hosmer and Lemeshow (2000) suggest that a collection of variables, each of which is only weakly associated with the outcome may together be an important predictor. Other researchers point out multidimensional measures cannot necessarily be combined into one overall index of satisfaction without compromising reliability (Lebow, 1982; Marshall et al., 1993; Hoff et al., 1999). In summary, not enough is known is known about the validity of satisfaction measures in discriminating among underlying constructs to warrant combining them into a unidimensional measure.

Multidimensional

Multidimensional measures that tap into patient valuations of diverse treatment characteristics and clinical phenomena, such as provider patient relationship, technical competence and accessibility seem to perform better than global satisfaction measures. (Marshall et al., 1993; Pekarik & Guidry, 1999). Multidimensional measures have been heavily influenced by the health care quality movement originating with the 1966 paper by Donabedian defining patient satisfaction as the ultimate validation of quality, and quality as the degree of effectiveness of care in achieving and producing health. Ware and Davies, who were among the first to define satisfaction as a multidimensional concept, suggested the five most important dimensions of satisfaction are quality of care, accessibility/convenience, finance, physical environment and availability (Barker & Orrell, 1999). Commonly, measures of patient satisfaction are limited to dimensions of

health care that are easy to improve such as waiting times and friendliness of personnel, but a study by Markham, Diamond, & Hermansen (1999) found that waiting time, for example, was least important to patients accounting for only 15 percent of the observed variance in patient preferences.

Two patient satisfaction instruments, the Patient Satisfaction Questionnaire developed by Ware, Snyder and Wright in 1976 (Marshall et al., 1993) and the Client Satisfaction Questionnaire (CSQ-18) developed by Larsen, Atkisson, Hargreaves and Ngyen and later shortened to eight items (CSQ-8) by Nguyen, Attkinsson and Stegner (Plante et al., 1998) have dominated the satisfaction literature in mental health. This section discusses the content and structure of these and similar measures. The basic approach has been to survey several hypothesized dimensions using separate items or subscales with or without an additional question or subscale for global satisfaction. Reliability is established through test-rest where scores are compared on two occasions to measure stability over time, and through inter-item reliability using Cronbach's coefficient alpha or the coefficient of determination to provide information on the proportion of total variance the items have in common (Kerlinger & Lee, 2000). Inter-item reliability reveals the correlations of items within each subscale with most researchers accepting only items that have correlations of 0.50 or better indicating at least a moderate correlation. Factor analysis is then used to as a construct validity tool to ensure subscales are measuring distinctly different underlying dimensions or latent factors, and to identify those that together account for the most variance (Kerlinger & Lee, 2000). What comprises the correct dimensions is contextual with a wide range of specificity with a tendency toward nonspecific content as mentioned earlier.

Baronet & Gerber (1997) used the CSQ-18 to conduct a mixed methods study of satisfaction with a sample of 99 clients from community crisis center. The correlation coefficient from test-retest procedures for total satisfaction scores on the CSQ-18 was 0.90. Chi-square test revealed statistically significant differences between satisfied and dissatisfied clients. Findings indicated that 40 percent of total variance in their model was explained by client evaluations of the worker, such as listening, attitude and caring behaviors. The CSQ18b was used by Williams et al. (1998) in another mixed methods study comparing the CSQ18b to unstructured patient interviews. They found that expressions of satisfaction on the CSQ-18b hid a variety of reported negative experiences that were derived from unstructured interviews. Plante et al. (1998) conducted a cross-sectional study of 115 6-17 year olds using the CSQ-8 to evaluate the relationship between treatment outcome and client satisfaction. The CSQ-8 was administered with outcome measures at three month intervals. Satisfaction remained high throughout the study and was not associated with outcome measures, age or gender.

Pekarik & Guidry (1999) conducted a study comparing satisfaction with outcomes measures at four and eight months using the Client Satisfaction Rating (Pekarik, 1996). The instrument consisted of four items each measured on a five-point scale: 'overall how satisfied are you with the services received'; 'would you recommend agency to others seeking help'; 'if you sought help again, would you return to agency'; 'how would you rate your therapist'. They found intercorrelations between 0.59 to 0.84 among satisfaction items and satisfaction ratings at four months highly correlated with

satisfaction ratings at eight months (r=0.88). Marshall et al. (1996) examined the association between self-reported health status and satisfaction with health care using the PSQ-III. The PSQ-III is a 50 item questionnaire with subscales for general satisfaction, interpersonal manner, communication, technical competence, time spent with doctor, financial aspects, accessibility and convenience, with each individual item measured on a five-point scale. Subscales were constructed by averaging across items within each dimension. Using factor analysis on the 17 composite indexes, researchers found both a six-factor and a higher order model revealing that satisfaction can be conceptualized hierarchically through an overarching general domain with a set of discrete dimensions tapping into unique aspects of satisfaction.

Moller-Leimkuhler et al. (2002) found global satisfaction to be highly correlated with discrete questions about satisfaction. Performing a correlation analysis between 24 distinct items on the Munich Patient Satisfaction Scale (MPSS-24) with six global satisfaction questions on the MPSS-72, they found the correlation between patient doctor relationship, cooperation and ward atmosphere, patient evaluation of nurse behavior and global satisfaction to be 0.71. Using just the 24-item multidimensional structure, a principal component analysis with varimax rotation was performed finding a three-factor solution with one dominant factor accounting for 37.8 percent of the total variance. The dominant factor was the patient-doctor relationship i.e., communication, empathy, efficacy of pharmacological treatment..

The doctor-patient relationship has been established as a feature of health care that patients do feel is important and most instruments will measure this in some fashion.

Meredith et al. (2001) conducted research evaluating the correlation between interpersonal aspects of the doctor-patient relationship and satisfaction with health care. Their satisfaction measure was a six-item questionnaire measuring: explanation of health problems, being given a choice about treatment, involvement in decisions about care, ease of getting help with emotional or personal problems, global satisfaction with overall health care and global satisfaction with health care for personal or emotional problems. The Interpersonal Patient Provider Rating Scale consisted of: patient can talk about personal things with the provider, patient comfort asking questions of the provider, the provider listens to the patient, patient control over treatment and provider understanding of how the patient is feeling. Researchers compared the fit of one-factor and two-factor solutions using confirmatory factor analysis and, despite the similarity of content between their satisfaction and interpersonal relationship measures, they found evidence for two distinct constructs.

McKinley et al. (1997) examined the reliability and validity of a 32-item multidimensional satisfaction scale for out-of-hours care. With the Eigenvalue fixed at one, a principal components analysis identified six components: communication and management (7 items $\alpha = 0.88$); doctor's attitude (5 items $\alpha = 0.87$); continuity of care (4 items $\alpha = 0.69$); delay until visits (3 items $\alpha = 0.65$); access (3 items $\alpha = 0.61$); and initial contact person (2 items $\alpha = 0.72$). Items were summed and expressed as percentage of the maximum possible score for that component. Each subscale tended to be highly correlated with overall satisfaction with care which itself was comprised of four items and yielded a Cronbach's alpha coefficient of 0.77 for internal consistency.

Brannan et al. (1996) examined patient satisfaction over continuum of care as part of the Fort Bragg Evaluation Project (FBEP). Researchers used the FBEP Satisfaction Scale which is a 29-item questionnaire measuring five latent factors: access and convenience (5 items), child's treatment process and relationship with therapist (5 items), patient and family services (4 items), and global satisfaction (4 items). Overall internal consistency for the ten subscales was >0.70. Confirmatory factor analysis was used to determine whether content areas of satisfaction scales represent distinct dimension of satisfaction. A five-factor model was hypothesized, but a four-factor provided the best fit. Researchers found a correlation between agreement regarding termination and greater satisfaction. Lambert et al.(1998) looked at the correlation between satisfaction with care, symptom change and perceived improvement. As part of the FBEP, children 5-17 receiving treatment and their parents were administered questions from the FBEP satisfaction scales and service specific satisfaction questions: global satisfaction, helpfulness and perceived improvement. Researchers tested five models hypothesizing different combinations of the three using confirmatory factor analysis. They found no correlation between satisfaction and symptom change.

Hoff et al. (1999) conducted a study evaluating whether patients with psychiatric diagnosis were less satisfied with care than non-psychiatric patients. The outcome measure, satisfaction with care, consisted of 43 questions related to coordination of care, open sharing of information, courtesy of staff, emotional support, attention to patient preferences/involvement in decision-making, quality of family involvement, physical comfort and attention to physical needs and help with transition out of hospital. Inter-item reliability, if tested, was not reported. Although the measure had the potential to

assess several dimensions of care including preferences, it was converted to a unidimensional measure. Subscale scores were averaged together and weighted for the number of items in each subscale. From their linear regression model they found psychiatric diagnosis to be a significant predictor of satisfaction with care.

Nabati et al. (1998) examined the psychometric properties of the 12-item Satisfaction Index for Mental health on a sample of 163 psychiatric patients selected at random from waiting areas in Veterans' Administration healthcare facilities. They used principal components analysis with only components having eigenvalues greater than 1.0 considered significant. They found one major and one minor component representing communication, humaneness, 'improvement, satisfaction, confidence that together demonstrated an internal consistency of 0.90. Researchers concluded satisfaction is unidimensional and items were summed into a single score.

Research on patient satisfaction using measures as they are currently designed have contributed minimally to our understanding of satisfaction. Even characteristics of the provider-patient relationship which measure better place a heavy burden on providers and perpetuate the continued use of measures that only reveal high satisfaction. Current measures seem to miss the mark regarding satisfaction with the treatment itself. One approach to measuring satisfaction that has met some success are utility measures. These measures such as willingness-to-pay, time-trade off and other scenario-driven exercises require respondents make choices based on ordered selections to the point of indifference between alternatives. Schiffner et al (2002) used these methods to assess satisfaction with port wine stain patients. Patients provided their subjective impression

of degree of improvement in the appearance of the port wine stains following laser treatments. Utility questions involving the patient's willingness-to-pay for an imaginary therapy to relieve their disease was used as a measure of satisfaction. They found patients evaluating their care as good were willing to pay more for the treatment than patients evaluating their care as bad. Patients with greater quality of life impairment following surgery were willing to pay more than patients with less quality of life impairment.

In a study of 300 randomly selected patients Markham et al. (1999) used conjoint analysis to investigate the relative importance of factors in doctor-patient interactions. Researchers created eight different scenarios for time in waiting room, medical skill of doctor, time to get referral, amount of billing problems and who makes care decisions with each measured on a five point scale. Creating a factorial design of every possible combination, they tested eight of the scenarios. They found perceived skill of the physician's accounted for 27 percent of the variance in patient preferences. Scott et al. (2002) conducted a stated preference discrete choice experiment for out-of-hours care. From 48 possible scenarios, 16 were generated using a fractional factorial design. One scenario was treated as constant to which the other scenarios were compared. The fifteen scenarios remaining were split into two questionnaires and administered to a sample of 3,893 primary care patients. They found the most important attribute was whether the doctor seemed to listen.

The state of the research on patient satisfaction measurement can be characterized by 1) reliance on qualitative research identifying relevant sources of dissatisfaction, but with little integration of findings into follow-on quantitative research; 2) lack of focus and

consistency in instrumentation and more importantly pursuit of what may be relatively unimportant sources of dissatisfaction from the patient's point of view; and 3) the absence of replication studies with different populations and instead, the creation of new instruments with every study. There is still much work to be done conceptually in the measurement of patient satisfaction, and this study does little to make revolutionary improvements. However, it does fill two important gaps. First, the research employs patient satisfaction as a predictor variable which has been suggested but not carried out. Second, it is one of the first studies to use national survey data to evaluate patient satisfaction, and the first study to use national data to examine the relationship between patient satisfaction treatment noncompliance.

CHAPTER 4 Data and measures

The literature suggests there are unexplained differences between individuals who terminate after the first few visits and individuals who go on complete outpatient care. This research goes one step further to suggest those differences may in part be a function of patient satisfaction. It is hypothesized that, after controlling for patient factors, levels of patient satisfaction will be associated with treatment noncompliance. This section describes the three research hypotheses and how MEPS data was reconstructed to support each of hypothesis. Second, the criteria and method for case selection into the study will be discussed to include handling of missing and truncated data. Third an explanation of variables selection is provided to include method and testing of the predictor variables, selection of sociodemographic and impairment variables, and construction of the compliance measure for the depression subgroup.

Three test hypotheses were formulated to examine the relationship (Figure 1). The literature suggests the first few visits are critical times in decision-making about subsequent appointment compliance. The first analysis concentrates on how levels of satisfaction affect the probability of having two, three and four visits. The emphasis is on how the probabilities of continuing treatment change in the presence of high and low satisfaction. To maximize the chances of observing an association between satisfaction with care and treatment compliance in this model, probabilities in the first four visits are compared with probabilities for continued care beyond four visits. The second analysis broadens the focus to the effects of patient satisfaction on continuation at any point in care. I examine differences in patient satisfaction across the entire duration of care,

predicting the hazard rate will be significantly different between high and low levels of satisfaction. The outcome of interest is time to dropout, or the failure rate among highly satisfied compared to dissatisfied respondents.

Selecting cases where treatment ended between one and four visits as a proxy for treatment dropouts, and cases where treatment ended with more than four visits as a proxy for treatment completion is imprecise. A third analysis will performed that employs minimum treatment standards to better simulate dropouts and completers. A cohort of respondents with a depression diagnosis are chosen for this analysis because 1) there is a practice guideline clearly stating a minimum number of visits for efficacious treatment, and 2) depression is a prevalent disorder and comprises the largest single diagnostic subgroup in the MEPS. The AHRQ clinical practice guideline for treatment of acute stage depression will be used (Agency for Health Care Policy and Research, 1993). In this scenario, respondents completing fewer than six visits are presumed to have terminated care before a minimum level of treatment has been attained (Berndt et al., 1998) (Melfi, Chawla, Croghan, & Hanna, 1998). Respondents completing six or more visits are presumed to have attained an adequate level of treatment. Because a respondent could have fewer than six visits, but taking medication and thus still in treatment, the compliance variable will account for medication. Olfson et al. (2002) estimate as many as 79.4% of the 1997 MEPS population are treated with pharmacotherapy making the remaining sample of non-medication respondents for this analysis quite small.

Hypothesis 1 There will be a relationship between satisfaction with care and the probability of second, third and fourth visits.

Hypothesis 2 The hazard rate for attrition from mental health care will differ for respondents with low satisfaction and those with high satisfaction.

Hypothesis 3 In a depression practice guideline derived subgroup analysis, respondents reporting higher satisfaction will be more likely to have six or more visits than respondents reporting lower satisfaction.

Figure 1 Research Hypotheses

Data for this study is drawn from 1996-1998 and 1998-1999 Agency for Healthcare Research and Quality (AHRQ) Medical Expenditure Panel Survey (MEPS) which provides nationally representative estimates of U.S. health care use and expenditures (Agency for Healthcare Research and Quality, 2001). The choice of secondary data over primary data collection was driven by two sampling issues. First, only a small portion of the U.S. population use mental health care each year which necessitates the use of a large data set to achieve an adequate sample. Second, although clinical settings are ideal for observing patterns of use and distinguishing early success from early termination, they are an inadequate source of data on individuals once they have left care. Household based studies with a longitudinal component such as the MEPS ensures the availability of respondent data independent of active treatment. Neither of these requirements could be adequately satisfied in a primary study without major time and funding commitments. The choice of MEPS over other national health care datasets was motivated by the availability of key research variables: satisfaction with care, treatment type, diagnosis, medications, impairment and sociodemographic characteristics.

This research builds on previous research in several ways. First, it includes empirically tested covariates previously shown to be related to either or both predictor and outcome variables. Second, it employs a measure of patient satisfaction that is consistent with the content and structure of previously used measures. Third, it employs number of visits as a measure of appointment compliance with outpatient mental health care. The research improves on previous research in several ways. First, satisfaction with care is employed as a predictor instead of as an outcome of care. Second, it is the first research to model the relationship between satisfaction with care and treatment compliance using a national sample. Third, it is one of the only studies on satisfaction and noncompliance to use household, versus clinically or administrative based data.

The research is not able to improve on the research in three major ways. First, there is no way to distinguish treatment dropouts from completers in absolute terms. The formulation of three hypotheses that tests three different visit thresholds for noncompliance is expected to offset this weakness. Second, the design of variables in MEPS lacks specificity to study treatment preferences-where predictors of noncompliance are thought to truly exist. For example, the variable for psychotherapy is a catch-all for every kind of psychologically-based treatment from individual and group psychotherapy, marital therapy and psycho-educational interventions, to patient management of medication regimens. Patient preferences may vary greater between each of these treatment types. Third, the data does not support satisfaction evaluations based exclusively on experiences with mental health care. Instead, responses to satisfaction questions are based on overall evaluations of health care. Importance weights must be designed to minimize the influence of responses from individuals with proportionally

more health care utilization and maximize the influence of responses from individuals with proportionally less mental health care utilization. Fourth, the data does not easily support the distinction of visits to multiple providers as long as the purpose was a mental health visit nor it is easy to distinguish separate episodes of care that may occur closely together.

MEPS is a stratified multi-stage area probability design household survey with an overlapping panel design (J. W. Cohen, 1997). Data are collected over a 30 month period to produce two calendar years of health care utilization and expenditure data with a new panel beginning each year. Five rounds of interviews are carried out at three to four month intervals, with each interview designed to obtain data on health care that occurred during that round. This research uses data from two panels: Panel 1 which consists of five rounds of household interviews that together produce data for 1996-1997, and Panel 3 which consists of five rounds of interviews that produce data for 1998-1999. Panel 2 for 1997-1998 was not an option because the Access to Care supplement where patient satisfaction questions reside is not available.

Each sampling frame for the MEPS is attained from the previous year's respondents to the National Health Interview Survey (NHIS) conducted by the National Center Health Statistics (S. B. Cohen, 2000). NHIS is a stratified multistage area probability design with oversampling of African Americans and Hispanics at rates of 2:1 and 1.5:1 respectively. The full NHIS sample each year consists of 358 primary sampling units and approximately 42,000 household across the country. The sub-sample drawn for the 1996 MEPS Panel 1 Rounds 1-5 were selected from two of the four 1995 NHIS panels and resulted in an un-weighted sample of 22,601 individuals. The sample for the 1998 MEPS

Panel 3 Rounds 1-5 were drawn from the 1997 NHIS for a sample of 11,137 individuals. For this study, only respondents with at least one mental health visit are selected yielding a sample of approximately 1,206 individuals and 15,090 visits for 1996-1997 with an additional 557 individuals and 7,854 visits for 1998-1999. Differences in sample size are due to the exclusion of Panel 2 observations in 1998.

MEPS is a component based survey. The Household Component (HC) collects detailed data on respondent medical and demographic characteristics: medical conditions; health status; use of health care services; charges and payments; access and satisfaction with care; health insurance coverage; income and employment (Agency for Healthcare Research and Quality, 2001). The HC was designed to produce national and regional estimates of health care utilization, expenditures, sources of payment and insurance coverage of the U.S. civilian non-institutionalized population. S. B. Cohen (1996) reports because of the complex design of the MEPS, sample data must be appropriately weighted to obtain approximately unbiased national estimates for the U.S. civilian non-institutionalized population. Sampling weights reflect the disproportionate sampling that results from oversampling of minority population, complete nonresponse of eligible sample units, partial response of survey participants providing data for only a portion of the data collection period, and poststratification to more accurate population totals from the Current Population Survey. In addition, because the complex sample design is different from simple random sampling, estimates of variability such as standard errors and confidence intervals requires special procedures to produce national estimates (Agency for Healthcare Research and Quality, 2001). AHRQ recommends not using sample sizes less than 100, and advise that survey estimates with relative standard errors equal to or greater than 0.3 be treated as unreliable. Although this study does not

primarily seek to produce unbiased national estimates with the data, a post hoc analysis will be conducted and compared to un-weighted results.

The Medical Provider Component (MPC) supplements and validates information on medical care events directly by telephone and mail-in surveys to medical providers identified by HC respondents. Medical and financial characteristics of medical events are obtained on all outpatient department and emergency room visits, hospital stays, home health care and pharmacy activities. The sampling strategy for surveys of office-based physicians providing care to HC respondents was slightly different. Zuvekas (2001) reports overall sampling rates of office-based health care events to be 50 percent in the MPC. The office-based MPC included all physicians of HC respondents receiving Medicaid; 75 percent of households receiving care under an HMO or other managed care plan; and 25 percent sample of remaining households (Agency for Healthcare Research and Quality, 1996).

The Prescription Component (PC) describes medications prescribed and refilled during each round to include prescription date, drug name, National Drug Code, quantity, dosage and condition for which the medication was prescribed (Moeller, Stagnitti, & Horan, 2001). Although medical conditions are surveyed as part of the HC, the data is contained in a separate data file called Medical Conditions (MC). This research uses data from the HC, Medical Conditions, MPC outpatient department, MPC office-based provider and MPC pharmacy components. For each calendar year, separate component public use files are released by AHRQ. For Panel 1 Rounds 1-3 (1996) there is one data file each for the HC, Medical Conditions, MPC office-based provider, MPC

outpatient department provider and MPC prescription drugs. In subsequent years, each of the data files contains two overlapping survey panels. To estimate a single year of health care utilization and expenditures, there is no distinction between the overlapping panels, but to construct two calendar years of data, such as for this study, the panels must be subset. For example, to construct 1996-1997 data, Panel 1 rounds 1-3 for 1996 must be combined with Panel 1 rounds 4-5 for 1997. In doing so, Panel 1 rounds 4- 5 must be selected while discarding Panel 2 rounds 1-3 reported in the same 1997 file.

Selecting cases

The outcome of interest for this study is the number of visits. All reported visits in the MEPS were subjected to a three criterion test. First, the visit had to be for outpatient care. This criterion was met by drawing visits only from office-based and outpatient department MEPS files. The file structure of office-based and outpatient department files are identical except for event type. To simplify case selection, office-based and outpatient department files were merged to create a single outpatient visits file for each survey year. Second, the visit had to be for a mental health purpose or condition. Either it had to be coded as 'psychotherapy' on one of two variables, or there had to be a Ninth Revision, International Classification of Disease (ICD-9) mental health diagnostic code assigned to the visit. A full discussion of diagnostic codes is provided later in this section. Third, the first visit meeting the above criteria had to occur within the first three rounds of Panel 1 for 1996-1997 and Panel 3 for 1998-1999 to coincide with administration of satisfaction with care questions. If the satisfaction survey were allowed to precede the first visit, then there is zero possibility that level of satisfaction could be a

product of experiences with outpatient mental health care, except as an artifact of any previous experiences.

Once selection criteria had been applied to the four outpatient event files, and mental health visits were selected based on their first occurrence during Rounds 1-3 of Panel 1 and Panel 3 files, person ID's from these files were matched to additional mental health visits that occurred in Rounds 4-5 of 1997 and 1999 respectively. No new 'first visits' were selected in the second year of data collection for the reasons stated in the previous paragraph. Outpatient visits for 1996 Rounds 1-3 and 1997 Rounds 4-5 were merged into a single file to create a Panel 1 Rounds 1-5 data file containing 15,090 outpatient mental health visits. Similarly outpatient visits for 1998 rounds 1-3 and 1999 Rounds 4-5 were merged to create a single data file of 7,854 outpatient mental health visits for Panel 3 Rounds 1-5. As expected with mental health utilization data, the distribution of visits is positively skewed with 46 percent of respondents having four or fewer visits.

Person ID's from the selected visits were matched with corresponding 'person level' data contained in the HC file. Respondents in the HC without a matching visit were dropped from the sample. Recalling there is one HC file for each survey year, HC files from Panel 1 1996 and 1997 and Panel 3 1998-1999 also required merging. Although some information in the HC files did not change from year to year, such as gender and race, there were other variables for which multiple instances had to be retained, such as annual expenditures, reference period dates, changes in insurance coverage and round specific variables for health and mental health status. After observations with non-matching ID's were dropped and multiple occurrences of common variables had been

uniquely renamed, the four HC files were merged to form a single HC file for 1996-1997 and a single HC file for 1998-1999.

Dates in the visits files were examined for completeness. Coded as '-9 Not ascertained' or '-8 Don't know', there were 1129 missing day variables, 34 missing month variables and one missing year. This presents a problem for using time-to-event methods which requires complete date values for conversion to julian dates. Precision in reconstructing the exact visit date is not necessary since the analysis calls for evaluating number of visits until failure- not intervals between visits or hazard rates in real time. As a result, logical edits were judged appropriate and were applied to missing dates using the parameters given by beginning and end reference period dates for each round. If day alone was missing it was edited as the 15th of the month. If more than one day value was missing in the same month for a single respondent, the missing values were replaced with '15' for the first missing day value, '16' for the second value, '17' for the third missing value, etc. until all missing values for that month had been replaced. If both day and month values, just month values, or just year values were missing, the missing values were edited to the reference period begin date for that round.

Because the study seeks to capture information on treatment dropouts and because it is difficult to distinguish dropouts in absolute terms, every effort is needed to minimize the appearance of failure due to other causes such as truncated data. Truncation occurs when a person is lost to follow-up during the study period (W.Y. Tsai, personal communication, September 16, 2002). In the MEPS truncation can occur when a respondent is out of scope, or ineligible during some portion of the study. According to

MEPS documentation, respondents were assessed for eligibility at each interview (2001). Ineligibility could be temporary due to such factors as institutionalization or absence from the household, or ineligibility can be permanent due to death, relocation outside the U.S. or withdrawal for some other reason. If a respondent has one or more mental health visits, is out of scope for one or more rounds, but then is in scope thereafter, what looks like a lag time between visits signifying a separate episode of care may be the result of truncation.

Visual inspection identified 149 respondents from the Panel 1 HC file and 64 respondents from the Panel 3 HC file as having some kind of truncation problem where respondents were out-of-scope for at least part of one round. From Panel 1 eight had interruptions in eligibility due to institutionalization, 14 joined the reporting unit after round 1 began, four were deceased and one moved. From Panel 3, six had interruptions in eligibility due to institutionalization, five joined the reporting unit after round 1 began, and five became permanently ineligible because of relocation or death. The greatest number of truncated cases resulted from nonresponse. There were 91 respondents from Panel 1 and 48 respondents from Panel 3 that left the survey after Round 3 without a disposition. All respondents for whom truncation is noted were retained in the data with an indicator variable created to flag these cases for later analytic purposes.

A similar analytic problem with longitudinal data is right and left censoring. Right censoring occurs when the study period ends before a respondent has experienced the event of interest. Left censoring occurs when the event of interest has occurred before the study period begins. According to Kleinbaum (1996) even though both truncated

and right censored observations are incomplete, the information up to the time the study ends or until we lose track of the person can still be used. Left censored data in the context of this study is more worrisome since visits may have occurred before the study began resulting in an underestimation of number of visits. There are two options for dealing with left censored data. The first is to exclude observations that are likely to be left censored such as those where the first known visit occurred early in the study period. L. G. Kessler et al. (1980) suggest an eight week interval between successive visits is the maximum lag time that should occur without signifying a new episode. Researchers investigating depression treatment have used a six month pretreatment period free of any indication of diagnosis or treatment for depressive illness to identify the beginning of an episode(Croghan, Obenchein, & Crown, 1998).

The eight week criterion has been used in recent research (Berndt et al., 2000; Rosenthal, 2000). However, there are concerns about its impact on sample size loss. In the NMES, Hawkins (1997) estimated that eliminating episodes that started in the first eight weeks would lead to a 42 percent sample loss dataset. This is particularly problematic with surveys when data collection begins at the start of the calendar year, a time that has the highest incidence of people starting treatment (Hawkins, 1997). Applying the eight-week interval to this study would mean that all respondents who had a mental health visit within eight weeks of the beginning of data collection would be excluded. Thirty-eight percent of the Panel 1 sample and 34 percent of the Panel 3 sample would be lost. Although leaving left censored observations in the sample systematically underestimates number of visits, it is a trade-off. Round 1 observations are most likely to be censored, but these are also the observations that temporally precede

administration of the satisfaction survey during Round 2. Retaining these is highly desirable even at the expense of underestimating number of visits. A flag variable is created for left censored cases to use for analytic purposes.

Selecting variables

Satisfaction with care

This section describes the handling of missing data on satisfaction with care variables, testing of the satisfaction measure and construction of importance weights to minimize the influence of satisfaction responses derived from health not mental health experiences. A table of descriptive statistics for satisfaction variables is available in **Table 17**. As discussed in the literature review satisfaction with care has been conceptualized as either a unidimensional and a multidimensional construct with the strongest empirical support pointing to its use as a multidimensional construct. For this study, a multidimensional measure of satisfaction with care is constructed using survey questions from the Access to Care supplement of the HC. Although no respondents were identified as ineligible for the supplement, there were still between 139 and 211 missing observations resulting from questions not asked due to skip patterns in the interview. Scored as '-1 Inapplicable', the first skip pattern resulted in 139 missing on five satisfaction questions. A second skip pattern resulted in 211 missing on one other question for 'appointment difficulty'. By eliminating the 139 as not belonging in either numerator or denominator, it reduced the missing on five variables to zero, but 72 missing remain on 'appointment difficulty'.

There were three ways of handling this problem. One method would be to eliminate the full 211 which would result in no missing values on any of the six satisfaction variables and would provide a remaining sample size of 995, but at the cost of losing 72 non-missing observations on the four variables that were only missing 139 values. The second method would be to eliminate the 139 observations, and drop the variable 'appointment difficulty' from the survey. This would result in five remaining satisfaction variables and provide a sample size of 1067, but it creates another problem. If 'appointment difficulty' is eliminated, the second variable 'difficulty contacting provider by phone', is no longer an adequate conceptual representation of 'access' and must also be eliminated leaving four satisfaction variables. The third method is to drop the 139 observations, but attempt to retain 'appointment difficulty' and 'telephone difficulty' in spite of missing values. The third method was chosen.

The satisfaction measure consists six questions hypothesized to represent four underlying dimensions of satisfaction: access (two items), patient-provider interaction (two items), satisfaction with staff (one item) and satisfaction with quality of care (one item). The goal is to devise a measure from these six variables which accounts for the most variance, but which produce the least redundancy, or shared variance. To explore the relationship between the variables, a correlation matrix was produced which indicated 'satisfaction with provider/staff' and 'satisfaction with quality of care' are moderately correlated ($r = .58$) and share .22 of the variance (average inter-item covariance). Satisfaction with quality of care and confidence in provider were correlated at $r=.55$. Confidence in provider and provider listens were correlated at $r=.50$. Appointment difficulty and phone difficulty was .42. Confirmatory factor analysis was

used to evaluate the feasibility of a four factor model. Principal components analysis with varimax rotation indicated that the six variables measure unique aspects of satisfaction and should not be combined into subscales as planned.

The second stage in constructing the satisfaction measure was to develop importance weights that maximize the influence of respondents with greater mental health utilization and minimize the influence of respondents with greater non-mental health utilization. Respondents are likely to base their satisfaction evaluations on that with which they have had more experience. Therefore, respondents with a higher ratio of mental health to non-mental health utilization are likely to have based satisfaction evaluations on their experience with mental health care. Respondents with a low ratio of mental health to health utilization are likely to have based satisfaction evaluations on non-mental health care. There were several options developing importance weights. The first method was to use the ratio of mental health to non-mental health expenditures. The advantage is that more complex encounters in which there is more contact with provider and provider staff will have greater costs and will count more. However, there are two disadvantages.

First, the range of potential costs associated with outpatient mental health visits is less than the range of potential costs associated with non-mental health care visits; there are only a limited number of diagnostic tests and treatments routinely associated with outpatient mental health care. The other disadvantage is that, although expenditures reflect the cost of care, with insurance most individuals do not bear the full cost. The second method was to use the ratio of out-of-pocket mental health to out-of-pocket

non-mental health expenditures. Out-of pocket payments have the advantage of better reflecting patient opportunity costs. The disadvantage is out-of pocket payments are conditional on insurance plan, and many insurance plans have better coverage in the form of lower out-of-pocket costs for non-mental health care over mental health care. The third method was to use the ratio of frequency counts of mental health visits to non-mental health visits where only the quantity of visits matters. The advantage is every visit of each type counts equally regardless of how costs are distributed. They disadvantage is that visit counts do not account for patient sacrifice other than time costs.

Because the choice is not straightforward, all three types of importance weight were evaluated. Variables were created, each a ratio of mental health to all health care expenses, out-of-pocket payments or visit counts. A clear advantage to visit weights was revealed from the fact that, unlike the ratio of out-of-pocket costs, the ratio of mental health to all health care visits can never be zero because there will always be at least one visit. Although one might expect the three types of weights to be highly correlated since they, in theory, measure the same thing, the correlation coefficient suggests a more moderate relationship. The strongest correlation was between visit weights and expenditure weights ($r=.68$). Expenditure weights and out-of-pocket payment weights were correlated at.59. The correlation between visit weights and out-of-pocket payment weights was the lowest ($r=.40$). Next the distribution of the three weights of the population were examined. Both expenditure weights and out-of-pocket payment weights were positively skewed with out-of-pocket payment weights showing the most extreme distribution. Many respondents had close to zero out-of pocket payments for

mental health care even among the uninsured group. The distribution of expenditure weights was positively skewed but with more of a curvilinear shape. Visit weights also displayed a curvilinear shape, but without the skewness seen with the other two weights. Because of the skewed distributions for expenditure and out-of-pocket weights, the means were also different . The visit weights were favored over out-of-pocket and expenditure weights.

Sociodemographic Covariates

This section discusses selection of sociodemographic variables to support the three study hypotheses to include selection and construction of insurance variables. A table of descriptive statistics for sociodemographic variables is available in Table 18. Several sociodemographic variables served as covariates: age, race, gender, education and insurance. Each was chosen for its empirical importance in influencing treatment duration and/or patient satisfaction and thought to confound the hypothesized relationship between satisfaction with care and number of visits. The covariates are not exhaustive and there is always the risk of outside factors influencing the data which are not measured. Coding on the selected covariates in MEPS is straightforward. Age is a continuous variable recoded categorically for '0-4', '5-17', '18-24', '25-44', '45-64', '65-90'. Five missing values on age were replaced with the sample mean. Children were retained in the sample, but ages 0-4 are unlikely to have an outpatient mental health visit and more likely to have parents/caretaker responses to satisfaction questions. Nonetheless there is no empirical evidence to suggest children should be excluded. Gender is coded as 'M' or 'F'. There are two variables for race in the MEPS: Race includes 'American

Indian', 'Aleut/Eskimo', 'Asian or Pacific Islander', 'Black', 'White' and 'Other'. The sample size for American Indian, Aleut/Eskimo and Asian or Pacific Islander was less than 5 percent of the total sample and would result in small cell size. As a result the second race variable: Race/Ethnicity was selected: 'Person is Hispanic', 'Person is Black/Not Hispanic', 'Other'. This will capture the two largest non-white ethnic groups: Black and Hispanic. The education variable has eight levels in the MEPS which were collapsed to four levels for this study: 'No degree', 'High school diploma/GED', 'Bachelor's/Other degree', 'Master's/Doctorate degree', 'Under 16- Inapplicable'. Missing data was infrequent on demographic variables, but when a missing value occurred, the sample mean was used and flag variables created for the category of missing ('don't know' and inapplicable') for analytic testing if needed

There are over 300 variables in the MEPS pertaining to insurance coverage. For this study it is be important to know 1) whether the respondent had health insurance and 2) whether changes in coverage occurred over the 24 month study period. Respondents who have no insurance, or who experience disruptions in coverage, would likely make different decisions about continuation in mental health care. Monheit et al. (2001) reports 92.0 percent of MEPS respondents had full-year private health insurance coverage for 1996. The rate was slightly lower for African Americans (87.0) and Hispanics (88.9). In this sample 86 percent had full-year private coverage; 78 percent of African Americans and 85 percent of Hispanics. Monheit et al. report 75 percent of individuals with public insurance had full-year coverage in 1996. In this study the rate was also 75 percent. They found poor people have greater stability in their public coverage than any other income group except high income. One fifth of those with

public insurance became uninsured at some point in the year and only 70 percent of people uninsured at the beginning of the year acquired insurance later in the year.

Four insurance variables are used for this study: COVRG123 and COVRG45 are categorical variables with three levels for '1 private insurance coverage', '2 public insurance coverage' and '3 uninsured'. Two new variables INSCHANG and RINSUR were constructed based on the extent of public or private health insurance coverage extending over the 24 month data collection period. RINSUR is the ratio of insured to uninsured months and INSCHNG is a categorical variable derived from RINSUR: '1' is 18 - 24 months coverage; '2' is 12 - 17 months coverage; '3' is 6 - 11 months coverage ; and '4' is 0-6 months coverage. There were 96 and 48 missing observations for insurance coverage. A cross-check found all cases flagged for truncation which indicated those respondents were out of scope for at least part of one round.

Impairment Covariates

Severity of illness is expected to influence decisions about the duration of mental health care through respondent perceptions of severity of illness and provider assessment and recommendations about the type and intensity of care needed. This section provides a discussion of impairment variable selection, to include methods, strengths and limitations of selected variables. A table of descriptive statistics for impairment variables is available in Table 21. MEPS variables that address the severity of illness do so in only two ways. First, through a diagnosis and second, through self reported perceptions of illness such as health, mental health status and activity and social

limitations. Diagnosis in the MEPS was attained by recording respondent descriptions of medical conditions which were then converted by professional coders to ICD-9CM diagnostic codes (Agency for Healthcare Research and Quality, 1996). The precision of diagnosis is subject to the ability of the respondents to report conditions that could be coded accurately. For confidentiality, all MEPS diagnoses were collapsed to three digits of five digits in public use files. Mental health diagnoses selected for this study are shown in Table 20 and exclude substance abuse disorders. Individuals with substance abuse disorders may face a very different demand curve for treatment than individuals with other mental disorders; treatment is often involuntary and the decision to comply based on more complex factors outside the scope of this study. Except for depressive disorders, the numbers of respondents with bipolar disorders, psychotic disorders among others, is small. For this study I am most interested in whether a respondent is being seen has a mental health diagnosis, a medical diagnosis only or no diagnosis, but I acknowledge the severity of illness and rational behavior that can be expected from for example an individual having a psychotic disorder is quite different from an individual having an adjustment disorder. Not controlling for each diagnosis is a study weakness.

There are variables for diagnosis at both the condition (HC) and the visit level. Because the unit of analysis for this study are 'visits', visit-level diagnoses were used. This allowed selection of cases where there was a mental health visit even when no diagnosis was made, and to exclude cases where there was a condition but no related visits. The disadvantage to using visit level diagnoses is that an individual may have many visits and as many as four diagnoses for each. This ambiguity is different from evidence of comorbidity, where two or more mental health conditions are present and under

treatment simultaneously. Comorbidity would appear as two or more ICD-9 diagnoses together in the same visit or visits.

To address the problem of ambiguous diagnoses, hand selection of the first mental health diagnosis coinciding with the earliest visit was made. If comorbidity was evident then the diagnosis in the primary, or first position, was selected. If no diagnosis appeared then the person was coded 'no diagnosis'. If only medical diagnoses appeared across visits, the respondent was coded as having a 'medical diagnosis only'. From the Panel 1 files there were 740 respondents with a mental health diagnosis; 216 respondents with only a medical diagnosis; 111 respondents with neither a mental health nor medical diagnosis; and four for whom diagnosis was not known (eventually replaced with the modal value of '311'). From the Panel 2 files there were 420 respondents with a mental health diagnosis; 99 respondents with only a medical diagnosis; and 38 with neither a mental health nor a medical diagnosis.

To validate the hand selection of diagnosis, ICD9 codes from the MC file were matched with event-level codes described above to examine the data for discrepancies. Recall that MEPS respondents identified existing medical conditions, independent of conditions specifically associated with health care events or visits. From the 1,067 respondents in Panel 1 mental health visit files, there were 89 (.08) discrepancies between visit and condition diagnosis: 52 discrepancies where there was a mental health condition, but only general medical visit-level diagnosis; nine discrepancies where there were two different mental health diagnoses; and one mental health condition where the visit-level diagnosis was coded as 'don't know'. The diagnosis coded as 'don't know' was

replaced with the condition-level diagnosis. In the match between medical conditions and event-level diagnosis for the Panel 3 files, of the 557 respondents there were 28 (0.05) discrepancies: 17 discrepancies where there was an mental health condition, but only general medical visit-level diagnosis; five where there were two different mental health diagnoses; and six where there was a mental health condition but the visit-level diagnosis was coded 'no diagnosis'. Additional discrepancies in diagnoses were found when depression cases (below) were evaluated using MEPS data center non-public use files suggesting underestimation of sample wide depression cases in this study.

The third test hypothesis for this study requires a subgroup of patients diagnosed with depression. However, because of the three digit collapsing, additional measures are required to parcel out depression from diagnostic categories '296' and '300'. In their study on national trends in outpatient treatment of depression Croghan et al (1998) and Olfson et al.(2002) used 296.2 major depressive disorder, single episode; 296.3 major depressive disorder; 300.4 dysthymic disorder, recurrent; and 311 depressive disorder, not otherwise specified to define depression. Using this same categorization required the fourth digit of diagnostic codes available by accessing non-public use files directly from the AHRQ data center.

Respondent perceptions of severity of illness was constructed by using several MEPS variables: perceived health status, perceived mental health status and work, activity, cognitive and social limitations. Perceived health status is included based on previous research findings that chronic illness is often a factor in mental health utilization. For example, in the Panel 1 data 21 percent of individuals with a mental health visit had a

medical, but no mental health diagnosis. The current data suggested the correlation between 'perceived health status' and 'perceived mental health status' variables might be too high to use separately (r=.51). This occurred only in the depression subgroup analysis and was addressed by omitting mental health status since most in the depression subgroup were known to have poor mental health status. Perceived health status and mental health status are each categorical variables measured on five levels: 'excellent', 'very good', 'good', 'fair' and 'poor'. A problem is that these are multi-round variables that must be reduced to avoid the autocorrelation problem characteristic of time series data. There are three options for reducing these to two single variables. Some MEPS researchers collapsed health status categories to three broader categories: 1) excellent, very good or good all year, 2) fair or poor all year and 3) ever in fair or poor health during the year (Monheit et al., 2001). A second option is to use the average response over five rounds. The difficulty with this approach is that for most respondents, mental health visits will not extend over five rounds. Assuming respondents report better health and mental health status both before and after receiving care, the average response will result in less variation than a point in time value. A third option is to select the instance that coincides with the round of the first mental health visit. This captures the degree of impairment at the point of care which is more desirable than the other two options. Missing values are resolved by carrying forward the last non-missing observation when possible. In five cases this was not possible and these remain missing (Table 21).

Other impairment variables available in the MEPS are activity limitations, social limitations and cognitive limitations. Although activity and social limitations are coded for all respondents, cognitive limitations is missing almost 200 observations as

'inapplicable'. A closer examination indicates these were children for whom the question was not appropriate. No substitute question was available so this variable was dropped altogether from the study. 'Activity limitations' and 'social limitation's are also multi-round variables assessed during Rounds 1, 3 and 5. As before, the round coinciding with the first visit was used. There were many more missing values because of the skip pattern discussed earlier making the variables inapplicable for some respondents. A correlation matrix reveals a moderate correlation between activity and social limitations at .57. Multicollinearity was be addressed by omitting social limitations. This occurred only in the depression subgroup analysis.

Constructing compliance measure

Although psychotherapy, is the focus of this study, it is not the only form of outpatient treatment, and in fact is not even the most common. Rates of pharmacologic treatments for many conditions, such as depression and anxiety is rapidly increasing. (Olfson et al., 2002) estimates that almost 80 percent of patients treated for depression in 1997 received a prescription for an antidepressant. Mental health treatment may be carried out using some combination of psychotherapy and medication, depending on the condition, clinical setting and provider. If a respondent has ceased to have mental health visits, but is still taking psychotropic medication, then they have not really dropped out of treatment. Therefore, the distinction is important. This section provides a description of the method used to construct a measure of compliance for the depression treatment compliance subgroup that uses a combination of visits and medications.

To construct this information, several variables from the outpatient event and prescription drug file were needed. Medication name and national drug code are used to derive the name of the medication. Because some drugs have both psychiatric and non-psychiatric applications, ICD-9 diagnosis from the prescription drug file were used in concert with drug name to ensure the drug is being used in the treatment of a mental health problem. Using the previous list of ICD-9 codes to establish a mental health diagnosis there were 13,977 drug events for 925 respondents. Of those respondents with any mental health diagnosis, there were 11,445 drug events for 842 respondents that involved psychotropic medications. To isolate respondents being treated for depression, the criteria was further narrowed to those respondents on a psychotropic drug with diagnoses of '296.2/3' '300.4' '311' yielding 9,979 psychotropic drug events for 791 respondents. Finally, respondents being treated for depression and taking at least one antidepressant medication were selected yielding 5,115 drug events for 650 respondents. Once it was determined that a relevant psychotropic drug existed, a dichotomous variable was created. A second data file was created for the 650 respondents with at least one antidepressant drug event containing the drug type and maximum number of prescriptions for each drug type.

The next question was how many prescriptions for an antidepressant were needed to establish that minimal treatment occurred in lieu of treatment visits. Four prescriptions for any antidepressant filled within six months of treatment initiation has been previously used as a proxy for minimally effective treatment published in AHRQ guidelines (Melfi et al., 1998; Tai-Seale et al., 2000). In this research the four prescription minimum will serve as a proxy for those who minimally met medication treatment

recommendations. Using this criteria 26 percent of the 650 respondents diagnosed with a depressive disorder who were taking an antidepressant medication had at least four prescriptions making them compliant irrespective of number of visits.

To prepare a model to test the hypothesis of a relationship between satisfaction with care and the probability of depression treatment compliance a subgroup of respondents with a diagnosis of '296.2', '296.3' major depressive disorders; '300.4 neurotic depression' and '311 depressive disorders' was selected (N=967)[1]. Of the 967 respondents with a diagnosis of depression, 650 received at least one prescription for antidepressant drug and 168 received at least four prescriptions.[2] Based on the four prescription or more than five visit criteria to establish depression treatment compliance, a total of 619 respondents were deemed completely compliant. This left 348 respondents with a diagnosis of depression who were noncompliant.

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[1] Depression cases accessed from condition files at the MEPS data center yielded a slightly large number of respondents because of differences in case selection criteria.
[2] The remaining 317 of 967 were either not on any psychotropic medication or were on a non-antidepressant psychotropic medication.

CHAPTER 5 Results

This chapter is comprised of two sections. The bivariate analysis section describes basic characteristics of the data with two goals in mind. The first goal is to describe utilization rates across the sample population in order to identify patterns in the average number of visits and to describe changes in the proportions of users at each level of use. Two sets of tables are provided in this section to show the average number of visits across the sample population and sample population changes occurring over the first 15 visits. The second goal of the bivariate section is to describe chi square tests of association and univariate regression models that establish fundamental relationships between variables. The purpose is to understand how and if predictor and control variables are independently related to the study outcomes, and how and if predictor and control variables are related to each other. Two tables of bivariate associations are provided for associations in the first four visits and associations in the depression treatment compliance.

The second section of the results chapter describes the analytic models to address the three research hypothesis. Each section describes main effects and interaction models and is organized for each of the six satisfaction with care variables. The first models evaluate the relationship between satisfaction with care and the probability of a subsequent visit. One table of main effects for the probability of more than one visit is provided with summary tables of significant interactions for each satisfaction variable. The second models evaluate the relationship between satisfaction with care and the

probability of depression treatment guideline compliance. Tables are provided for full and reduced main effects models and significant interaction terms. The third models use survival analysis to evaluate differences in time to failure rates between high and low satisfaction with care. Figures of Kaplan-Meir curves, adjusted survival curves and a summary table of stratified Weibull regression models is provided in Appendix C.

Bivariate statistics

This section explores bivariate associations between satisfaction with care, covariates and number of visits. First, high and low utilizers of outpatient mental health care were identified by examining the mean number of visits across the sample and within the depression subgroup. Second, the data was examined for differences in the population between those who dropped out early, those who remained in care longer, and those who were part of the depression subgroup. Third, contingency tables were used to describe bivariate associations between each of the satisfaction and control variables and the probability of more than one, two and three visits, and probability of compliance for the depression subgroup. Chi-square statistics confirm the statistical importance of each variable providing support for variable selection in multivariate models. Fourth, covariates were used in univariate regression models to test for potential confounding effects that can occur when a covariate is related to both a predictor variable and an outcome variable.

Mean differences in visits

I examined the data to determine the average number of visits. Table 22 (Appendix A) indicates individuals in excellent mental health, with no diagnosis, age groups 18-24

and 65-90, and individuals who were not at all satisfied with quality of care had the fewest number of visits. Individuals in poor mental and physical health, ages 0-17 and 25-44, college education, publicly insured, and individuals with social and activity limitations had the highest number of visits. Analysis of variance was used to test for differences in mean number of visits and revealed significance differences for health, mental health, activity limitations, social limitations, and psychotropic medication.

Within the depression subgroup there were also significant differences in number of visits (Table 23 Appendix A). Individuals in the age group 65-90, with less than a high school education, in excellent mental health and those not at all satisfied with quality of care had the fewest number of visits. Individuals with an advanced degree, under 16 years old, publicly insured, reporting excellent health and poor mental health and individuals not at satisfied with provider/staff had the highest average number of visits. Analysis of variance revealed statistically significant differences for education; health status; mental health; and social limitations[3].

Population differences

While it is helpful to know the average number of visits across the population, this does not reveal when, how and if the population changes as respondents dropped out of care. The three analytic models for this research examine the relationship between satisfaction with care and the probability of a subsequent visit capturing three different visit intervals and potentially three different populations of users. While the first four visits are the focus of the first model, the second model examines differences in more

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[3] ANOVA performed before dropping non-depression '296.X' and '311.X' observations

than five and less than five visits and the third examines the hazard rate across all visits. This could generate questions about whether differences in the effect of satisfaction on the probability of a subsequent visit is the result of real differences or simply changes that have occurred in the population as individuals dropped out of care. The sample was examined for changes in the population across intervals of visits to see if there were significant differences in the population that could influence the findings. In support of the first model, changes in proportions were examined between respondents having more than one, two and three visits (Table 1 below).

Table 1 Sample differences between more than one, two and three visits

	MT1 visit	MT2 visit	MT3 visit
Sample size	1103	965	860
Percentage at each visit	%	%	%
Gender			
Male	37.62	37.51	38.26
Female	62.38	62.49	61.74
Age			
0-17	16.23	16.96	17.05
18-24	5.53	5.10	5.14
25-44	37.22	36.37	37.16
45-64	27.20	27.55	27.21
65-90	13.82	14.02	13.44
Race			
Hispanic	14.51	14.82	15.00
Black	8.52	8.70	8.37
Other	76.97	76.48	76.63
Education			
No degree	17.32	17.62	16.40
HS/GED	41.07	39.79	40.47
Bachelor's/Other degree	19.49	19.79	19.65
Advanced degree	6.53	6.53	6.86
Insurance coverage			
Private	66.91	66.74	67.09
Public	26.38	26.63	26.51
Uninsured	6.71	6.63	6.40
General diagnosis			

	MT1 visit	MT2 visit	MT3 visit
Mental health	75.79	76.79	76.98
Medical diagnosis only	16.68	16.48	16.86
No diagnosis	7.52	6.74	6.16
Psychotropic drug			
No	42.97	41.45	40.81
Yes	57.03	58.55	59.19
Health status			
Excellent/very/good	64.85	63.82	62.95
Fair/poor	35.15	36.18	37.05
Mental health			
Excellent/very/good	60.19	58.73	56.61
Fair/poor	39.81	41.27	43.39
Activity limitation			
No	73.46	72.57	72.63
Yes	26.54	27.43	27.37
Social limitations			
No	85.50	85.20	84.94
Yes	14.50	14.80	15.06
Appt difficulty			
No	68.54	68.50	69.19
Yes	31.46	31.50	30.81
Phone difficulty			
No	93.64	93.56	93.42
Yes	6.36	6.44	6.58
Provider listens			
Yes	94.73	94.81	94.87
No	5.27	5.19	5.13
Provider confidence			
Yes	93.64	93.56	93.47
No	6.36	6.44	6.53
Satisfied with provider/staff			
Satisfied	94.01	93.87	93.47
Not satisfied	5.99	6.13	6.53
Satisfied with quality of care			
Satisfied	95.37	95.53	95.69
Not satisfied	4.63	4.47	4.31

For the second model, the depression treatment guideline compliant group, I wanted to know whether differences in the guideline compliant group were due to having more than five visits (from which the compliance measure is constructed) or whether differences in the population were the result of selection into the depression subgroup. Changes in proportions were examined between respondents who were treatment guideline compliant, all respondents who had more than five visits and only respondents with a depression diagnosis who had more than five visits (Table 2 below).

Table 2 Sample differences at five visits, for depressed subgroup at five visits and for respondents who were compliant with depression treatment guidelines

	Sample at MT5 visits	Depression subgroup at MT 5 visits	Guideline compliant group
Sample size	696	405	443
	%	%	%
Gender			
Male	38.65	30.37	30.47
Female	61.35	69.63	69.53
Age			
0-17	18.00	10.37	9.71
18-24	4.93	5.68	6.55
25-44	36.75	45.19	44.47
45-64	27.16	31.36	31.83
65-90	13.18	7.41	7.45
Race			
Hispanic	14.80	16.54	16.03
Black	7.76	7.90	8.13
Other	77.44	75.56	75.85
Education			
No degree	14.80	17.28	17.83
HS/GED	40.09	42.72	44.02
Bachelor's/Other	19.40	21.73	20.99
Advanced degree	7.76	9.38	8.80
Under 16 Inapplicable	17.96	8.89	8.35
Insurance coverage			
Private	65.95	62.20	62.53

	Sample at MT5 visits	Depression subgroup at MT 5 visits	Guideline compliant group
Public	27.16	29.63	29.12
Uninsured	6.90	8.15	8.35
General diagnosis			
Mental health	78.02	100.00	100.00
Medical diagnosis only	16.52	na	na
No diagnosis	5.46	na	na
Psychotropic drug			
No	39.22	18.52	16.93
Yes	60.78	81.48	83.07
Health status			
Excellent/very/good	60.99	60.25	61.17
Fair/poor	39.01	39.25	38.83
Mental health			
Excellent/very/good	54.59	51.60	53.05
Fair/poor	45.41	48.40	46.95
Activity limitation			
No	71.41	68.07	68.93
Yes	28.59	31.93	31.07
Social limitations			
No	84.57	81.84	82.69
Yes	15.43	18.16	17.31
Appt difficulty			
No	70.11	30.12	70.20
Yes	29.89	69.88	29.80
Phone difficulty			
No	67.00	66.91	33.18
Yes	33.00	33.09	66.82
Provider listens			
Yes	95.10	95.06	95.03
No	4.90	4.94	4.97
Provider confidence			
Yes	93.52	93.83	93.68
No	6.48	6.17	6.32
Satisfied with provider/staff			
Satisfied	92.23	93.09	93.00
Not satisfied	6.77	6.91	7.00
Satisfied with quality of care			
Satisfied	96.11	96.54	93.39
Not satisfied	3.89	3.46	3.61

In support of the third model estimating differences in the hazard rate between satisfied and not satisfied, changes in proportions were examined and between more than one visit, more than six visits, more than ten visits and more than 15 visits (Table 3 below).

Table 3 Sample differences from more than one to more than 15 visits

	MT1 visit	MT6 visits	MT10 visits	MT15 visits
Sample size	1103	640	482	357
	%	%	%	%
Gender				
Male	37.62	38.59	39.00	40.90
Female	62.38	61.41	31.00	59.10
Age				
0-17	16.23	17.99	17.13	17.96
18-24	5.53	5.04	4.28	4.37
25-44	37.22	36.69	37.43	37.38
45-64	27.20	27.48	26.44	23.30
65-90	13.82	12.81	14.71	16.99
Race				
Hispanic	14.51	14.53	14.52	12.32
Black	8.52	8.13	8.09	7.84
Other	76.97	77.34	77.39	79.83
Education				
No degree	17.32	13.75	13.90	11.48
HS/GED	41.07	40.16	40.66	39.78
Bachelor's/Other degree	19.49	19.84	19.09	21.01
Advanced degree	6.53	8.13	8.09	8.12
Under 16 Inapplicable	15.59	18.13	18.26	19.61
Insurance coverage				
Private	66.91	65.63	62.66	62.18
Public	26.38	27.50	29.88	30.25
Uninsured	6.71	6.88	7.47	7.56
General diagnosis				
Mental health	75.79	79.53	81.12	81.23
Medical diagnosis only	16.68	15.94	15.77	15.13
No diagnosis	7.52	4.53	3.11	3.64
Psychotropic drug				

	MT1 visit	MT6 visits	MT10 visits	MT15 visits
No	42.97	38.44	34.85	36.69
Yes	57.03	61.56	65.15	63.31
Health status				
Excellent/very/good	64.85	61.58	58.10	56.55
Fair/poor	35.15	38.42	41.90	43.45
Mental health				
Excellent/very/good	60.19	54.39	50.84	51.46
Fair/poor	39.81	45.61	49.46	48.54
Activity limitation				
No	73.46	71.45	69.62	67.43
Yes	26.54	28.55	30.38	32.57
Social limitations				
No	85.50	84.49	83.16	81.20
Yes	14.50	15.51	16.84	18.80
Appt difficulty				
No	68.54	69.69	69.50	68.35
Yes	31.46	30.31	30.50	31.65
Phone difficulty				
No	93.64	93.54	94.08	94.73
Yes	6.36	6.46	5.92	5.27
Provider listens				
Yes	94.73	94.98	94.38	94.37
No	5.27	5.02	5.63	5.63
Provider confidence				
Yes	93.64	93.42	93.54	94.08
No	6.36	6.58	6.46	5.92
Satisfied with provider/staff				
Satisfied	94.01	92.79	92.08	92.68
Not satisfied	5.99	7.21	7.92	7.32
Satisfied with quality of care				
Satisfied	95.37	96.08	95.42	96.06
Not satisfied	4.63	3.92	4.58	3.94

The proportion of males in the sample increased from 37% having more than one

visit to 41% with more than 15 visits (Table 3). In the treatment guideline compliant

group the proportion of males was even lower at 30% with the difference attributed to

selection into the depression subgroup (Table 2). The highest proportion of females is seen in the population having more than one visit (Table 1), those selected into the depression subgroup (Table 2), and among individuals treatment guideline compliant (69%)(Table 2).

The mean years of education at each visit did not vary[4]. However, there were changes in proportions by education. The number of respondents with less than a high school education decreased from 17.3% at more than one visit to 11.5% at more than 15 visits (Table 3). The proportion of respondents with less than high school was higher for the compliant group at 17.8% with most of the change due to selection in the depression subgroup (Table 2). Respondents with a high school education decreased from 41% to 39.8% (Table 3), but the proportion in the compliant group was highest at 44% with the difference due both to selection in the depression subgroup (42.7%) and having more than five visits (40.1%) (Table 2). The proportion of individuals with college increased between more than one and more than 15 visits (Table 3). Respondents with a bachelor's degree increased from 19.5% to 21% with most of the increase occurring between 10 and 15 visits (Table 3). In the compliant group the proportion with a bachelor's degree did not increase (Table 2). Individuals with an advanced degree increased from 6.5% to 8% with most of the increase occurring between 6 and 15 visits (Table 3). In the compliant group the proportion with an advanced degree was 8.8% which was less than for the proportion in the depression subgroup at 9.4% but greater than the total sample at more than five visits (Table 2).

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[4] Mean years of education at more than one visit was 11.4(4.4) and by more than 15 visits was still 11.7(4.5). The mean was 12.2(3.8) for compliance subgroup and 12.2(3.8) at more than 5 visits.

There were changes in sample proportions by insurance between one and 15 visits (Table 3) and between having more than five visits and treatment guideline compliance (Table 2). The proportion of privately insured decreased from 67% of the population at more than one visit to 62% by more than 15 visits (Table 3). In the compliant group the privately insured made up 62.5% with most of the difference due to selection in the depression subgroup (Table 2). The proportion of publicly insured increased from 26% at more than one visit to 30% at more than 15 visits with most of the increase occurring between 6 and 15 visits (Table 3). The uninsured represented 6.7% at more than one visit to 7.5% at more than 15 visits (Table 3). The proportion in the compliant group was slightly higher at 8.35 with the difference attributed to selection into the depression subgroup (Table 2). The proportion of individuals on a psychotropic drug increased gradually from 57% to 63% over 15 visits (Table 3). The proportion of respondents in the compliant group was 83% with 81.5% due to selection into the depression subgroup (Table 2).

There were differences in the population by health and mental health variables from one to three visits (Table 1), between more than five visits and the treatment compliant group (Table 2) and between one and 15 visits (Table 3). The proportion of individuals with a mental health diagnosis increased gradually from 76% at more than one visit to 81% at more than 15 visits. The proportion of individuals reporting poor health status increased from 35% at more than one visit and 37% at more than three visits to 43.5% at more than 15 visits. In the compliant group the percentage reporting poor health status

was 38% (Table 2). The proportion of individuals reporting poor mental health status increased from almost 40% at more than one visit and 43% at more than three visits to 48.5% at more than 15 visits (Table 3). In the compliant group the percentage reporting poor mental health was 47% (Table 2). The proportion reporting activity limitations and social limitations increased between more than one and more than 15 visits (Table 3). Individuals reporting activity limitations increased from 26.5% at more than one visit to 32.5% at more than 15 visits (Table 3); 31% for the treatment guideline compliant group (Table 2). The proportion of individuals reporting social limitations increased from 14.5% at more than one visit to 18.8% at more than 15 visits (Table 3); 17.3% in the treatment guideline compliant group (Table 2).

There were no changes in sample proportions for the satisfaction variables. The proportion of respondents reporting dissatisfaction ranged from 3-8% across all visits. The proportion of the population reporting satisfaction with quality of care, confidence in provider and no phone difficulty increased between more than one and more than 15 visits. The proportion reporting satisfaction with provider/staff decreased between more than one and more than 15 visits. There was no change in the proportion reporting appointment difficulty and provider listens. In summary significant changes in proportions were found between more than one and more than three visits for education, diagnosis, psychotropic drug, health and mental health status, activity and social limitations.

There were changes in proportions between all respondents with more than five visits, respondents with a diagnosis of depression and more than five visits, and

respondents with a diagnosis of depression who were treatment guideline compliant for education, psychotropic drug, mental health, activity and social limitations. There were differences in proportions between respondents with more than one visit and more than 15 visits for education, insurance coverage, diagnosis, psychotropic drug, health and mental health status, activity and social limitations.[5] Consistently across all comparisons lower education levels, and better health and better mental health status yielded higher rates of dropout while higher education, mental health diagnosis, psychotropic drug, poor health and mental health status, and greater activity and social limitations yielded lower dropout rates. The next section proceeds with the results by describing bivariate associations between variables through chi square tests of association and univariate regression models.

Bivariate associations

Two way contingency tables and chi-square statistics were used to examine bivariate associations between predictor variables, covariates and the probability of more than one visit, more than two visits and more than three visits. The purpose was to confirm variables for selection into a logistic regression model. Pearson chi-square procedures were used with a *p* value set at .25 as recommended by (Hosmer & Lemeshow, 2000). As shown in Table 4 and Table 5 covariates related to impairment showed the strongest bivariate association to having subsequent visits. Sociodemographic variables gender and insurance were not highly significant across visits except at the variable screening level of p<.25. There was a significant association between age and having greater than one visit,

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[5] Analysis of variance was used in a separate analysis comparing the population at exactly one visit, exactly two, exactly three visits and exactly one visit, exactly five visits, exactly ten visits and exactly 15 visits. There were no statistically significant differences in the population except for differences in education [$F(1,1054)=3.77(p=.05)$] and mental health [$F(1,1054)=16.23(p<.0001)$].

two visits and three visits. There was a significant association between education and having greater than two visits and greater than three visits. None of the six satisfaction variables were associated with the probability of a subsequent visit. At this stage all the selected variables were retained.

Table 4 Bivariate analysis of the first four visits

	Pearson Chi-square (df)		
	GE 1 visits	GE 2 visits	GE 3 visits
Age	12.90 (4) **	18.39(4) ***	22.91(4) ***
Gender	1.55 (1) *	1.16(1)	0.04(1)
Education	5.29 (4)	8.78(4) **	9.02(4) **
Race	0.46 (2)	0.41(2)	0.81(2)
Insurance changes	0.48 (3)	3.08(3)	4.96(3)*
Insurance coverage	4.71(2) *	3.77(2) *	2.61(2)
Diagnosis	56.39 (2) ***	55.17 (2) ***	48.0 (2) ***
Psychotropic drug	49.42 (1) ***	51.65(1) ***	48.22(1) ***
Antidepressant drug	43.59 (1) ***	54.43 (1) ***	47.67 (1) ***
Health status	14.90**	14.12**	13.08***
Mental health status	55.90***	65.32***	74.00***
Any limitation	25.77 (1) ***	28.00 (1) ***	18.49 (1) ***
Social limitation	5.80 (1) *	6.07 (1) *	5.42 (1) *
Satisfaction w/staff	1.24 (3)	1.54 (3)	1.92 (3)
Satisfaction w/quality	4.62 (3)	1.31 (3)	0.53 (3)
Appt difficulty	3.45 (3)	1.65 (3)	0.94 (3)
Phone difficulty	2.08 (3)	2.30 (3)	2.90 (3)
Confident in provider	0.05 (1)	0.001 (1)	0.03 (1)
Provider listens	0.93 (1)	0.32 (1)	0.12 (1)

*p<.25 **p<.05 ***p<.01

Table 5 Bivariate analysis of depression treatment compliance

	Pearson Chi-square (df)
	Compliant if >5 visits or > 3 antidepressant Rx
Gender	0.40 (1)
Age	12.43 (4) *
Education	6.73 (4) *
Race	2.68 (2)
Insurance changes	1.25 (3)
Insurance coverage	8.55 (2)
Truncated data indicator	15.76 (1) ***
Health status	16.05 (4) ***
Mental health status	28.51 (4) ***
Any limitation	6.70 (1) ***
Social limitation	.04 (1)
Satisfaction w/staff	4.31 (3) *
Satisfaction w/quality	5.91 (3) *
Appt difficulty	1.25 (3)
Phone difficulty	1.07 (3)
Confident in provider	1.66 (1) *
Provider listens	1.74 (1) *

*$p<.25$ **$p<.05$***$p<.01$

Confounding effects

Selected covariates (age, sex, education, race, impairment, insurance) have been associated with number of visits, satisfaction with care or both. Variables associated with both a predictor and an outcome variable can distort any statistical relationship if not controlled. Covariates were evaluated for confounding effects on the relationship between satisfaction and number of visits. Each covariate was entered separately into three different sets of univariate regression equations. The first regressing satisfaction with care on each covariate in separate logistic models. The second regressing the probability of more than one visit on each covariate in separate logistic models. The third regressing the number of visits on each covariate in linear models since hazard models will consider the total number of visits. Because of the skewed distribution of

number of mental health visits a natural logaritm transformation for visits was used. The results are described below.

Being female was significantly related to high satisfaction with provider/staff and quality of care but was not related to number of visits. Race was related to appointment difficulty. African American respondents were almost twice more likely than Hispanic respondents to report no appointment difficulty. White respondents were also more likely than Hispanics to report no appointment difficulty. Race was not significantly related to number of visits. Age was related to satisfaction. Respondents age 18-24 were 50% less likely to be highly satisfied with provider/staff (p<.01) and were 40% less likely to have more than one mental health visit (p<.05). Respondents 65-90 were 1.5 times as likely to report no appointment difficulty (p<.05) and were 40% less likely to have more than one mental health visit (p<.05). Age is a confounding variable for appointment difficulty and the probability of a subsequent visit.

Respondents with an advanced degree were 50% less likely to report no appointment difficulty (p<.001), but having an advanced degree did not significantly affect the probability of more than one visit. Education had a significant positive relationship to number of visits with higher education associated with a greater number of visits. For example, individuals with an advanced degree (Master's/doctorate) had an average of 19 visits—a higher average than even individuals with poor mental health (Appendix A Table 22). Education is a potential confounder for modeling the relationship between appointment difficulty and the probability of a second and third visit. Uninsured respondents were only half as likely as privately insured respondents to be highly

satisfied with provider/staff; but having no insurance was related to a greater number of visits. Type of insurance had a statistically significant effect on visits with private insurance being associated with fewer visits (p<.001). Table 22 (Appendix A) shows respondents with private insurance having an average of 12 visits, uninsured had an average of 13 visits and publicly insured had an average of 15 visits. The type of insurance coverage may be a confounding variable. The number of survey period months covered by some type of insurance was not a significant predictor of satisfaction or number of visits.

Among the impairment variables, respondents with a medical diagnosis only were 45% less likely to have confidence in the provider and respondents with no diagnosis were 50% less likely to have confidence in the provider. Diagnosis was a predictor of the number of visits. Respondents with a medical diagnosis were 55% less likely to have more than one visit and those with no diagnosis were 60% less likely to have more than one visit. Mental health diagnosis was also a significant predictor of overall number of visits. Diagnosis is a confounding variable. Health and mental health were significant predictors of having more than one visit and for number of visits, but neither were related to satisfaction with care. Respondents with activity limitations were 45% less likely to be satisfied with quality of care and 30% less likely to report no appointment difficulty but were over two times more likely to have more than one visit. Having activity limitations was also associated with a greater number of visits. Social limitations was not associated with satisfaction with care, but was associated with both having more than one visit and having a greater number of visits overall.

Summary

This section has examined bivariate association in the data. First, I described general trends in number of visits for each predictor and covariate finding that individuals age 65-90, with less education, in excellent mental health and not satisfied with quality of care had the fewest visits while age 0-17, with an advanced degree, publicly insured, in excellent health, poor mental health and not satisfied with provider/staff had the greatest number of visits. Second, I described changes in the population occurring with each visit interval as respondents discontinued care. This revealed significant changes in the population by education, diagnosis, health and mental health, psychotropic drugs, activity and social limitations and insurance coverage.

Third, to clarify variable selection for model building, I used contingency tables for each predictor and covariate to compare proportions in each cell for more than one, more than two and more than three visits. Chi-square statistics were used to evaluate the statistical likelihood of obtaining cell size at random. This revealed significant associations between the probability of more than two, three and four visits and age, gender, diagnosis, psychotropic drug, health and mental health status, insurance coverage and activity and social limitations. Fourth, in this section the covariates were examined for potential confounding effects on the relationship between satisfaction with care and number of visits and several potential confounders were identified: age, education, insurance, diagnosis and activity limitations. The next section will proceed with multivariate analysis. The six predictor variables and covariates will be evaluated for their

contribution to logistic models estimating the probability of more than one, more than two and more than three visits, and the probability of depression treatment compliance.

Multivariate analysis

Multivariate methods were used to test the three research hypothesis. First logistic regression models were estimated for the probability of a more than one, two and three visits. Second a logistic regression model was estimated for the probability of depression treatment compliance using a depression subgroup. Third survival analysis was used to estimated differences in time-to-failure rates between satisfied and not satisfied respondents. Model specifications, i.e. coding, choice of covariates and variable ordering for the logistic model predicting more than one visit served as a base model from which subsequent models were derived. The purpose was to keep the models as comparable as possible to support comparisons across models. Visit weights constructed as the ratio of mental health to total health care visits, were added as importance weights to each regression model. These serve to minimize the influence of satisfaction evaluations based on health not mental health care experiences.

With the exception of the survival model, each of the three main effects models were estimated both with and without MEPS analytic weights. To remind the reader analytic weights adjust for the complex survey design features inherent to large data sets. In complex survey design the probabilities of various subjects being selected for inclusion into the study are not equal because of oversampling, stratification and nonresponse adjustment. This can affect the accuracy of statistical analyses results and increase the likelihood of a Type 1 error (S. B. Cohen, 2000; Kneipp & Yarandi, 2002). Variance

estimation weights adjust for the increased variance produced due to unequal selection probabilities, nonresponse and stratification. Sampling weights adjust sample estimates to reflect the total proportion of people in the U.S. population. Both weighted and unweighted models were used because each carries some inherent risks to both. Without the analytic weights the data there is no adjustment for the oversampling of Africa Americans and Hispanics and adjustment for survey nonresponse. With the weights the standard errors become inflated when cell size becomes small as it invariably will in some models.

Satisfaction with care and the probability of a subsequent visit

The first logistic regression models assessed the effect of satisfaction with care on the probability of a subsequent visit after adjusting for sociodemographic and impairment factors. Models were estimated for the probability of more than one visit, more than two visits and more than three visits. The procedures for model selection are reported below. Results for each model are discussed separately for satisfaction with quality of care, satisfaction with provider/staff, confidence in provider, provider listens, appointment and telephone difficulty. A summary of the findings is presented at the end of this section before proceeding to the next section.

A logistic regression model estimating the probability of more than one visit was fit for main effects. Although there were empirical reasons for including all the covariates, the model was still tested to evaluate the best set of covariates. Forward selection procedures were used to identify variables that did not contribute significantly to the model. Hosmer & Lemeshow (2000) recommend the likelihood ratio test (LRT) which

compares the differences in the log likelihood function at each step of model estimation to test whether additional variable contribute significantly to the analytic model. A best subsets method was used whereby the sociodemographic variables were entered simultaneously followed by impairment variables and satisfaction with care variables. Using this method sociodemographic and impairment variables contributed significantly to the model at p<001. The satisfaction variables made a marginally significant contribution at p=.09. To evaluate the relative contribution of each variable to the three models, regression coefficients were standardized (Table 24 in Appendix B). This reveals how much variance in outcomes was uniquely contributed by each variable. Satisfaction with quality of care contributed almost six percent of unique variance in Model 1 (p<.01) and confidence in provider contributed almost four percent of the variance in Model 1 (p<.05). Activity limitations, health and mental health contributed the greatest portion of unique variance (p<.05). The unique variance contributed by gender and education was each made up six percent of the variance.

The three subsets of variables made a significant contribution to the model and were retained in the model estimating more than one visit. The same model specifications were used to estimate the probability more than two and more than three visits. Table 6 below shows the main effects for the relationship between satisfaction with care and probability of more than one visit. The model was significant at p<.0001 and accounted for 27% of the variance in the probability of having more than one visit. The second model (not shown) estimating the probability of more than two visits was significant p<.0001 accounting for 26% of the variance in the probability of having more than two

visits. The third model (not shown) was significant p<.0001 and accounted for 27% of the variance in probability of having more than three visits.

Table 6 Main effects model of the relationship between satisfaction with care and the probability of more than one visit

	Ref group in italics	LR X^2 statistic (df=36)		
		OR (SE)	Coefficient	95% CI
Sex	*Male*			
	Female	1.63(.28)**	.49	1.17-2.27
Race	*White*			
	Hispanic	.90(.21)	-.10	.54-1.42
	Black	.58(.16)*	-.54	.34-1.0
Age	*25-44*			
	0-17	8.29(10)	2.12	.77-89.1
	18-24	.98(.32)	-.02	.52-1.84
	45-64	1.13(.22)	.13	.78-1.66
	65-90	1.27(.33)	.18	.77-2.11
Education	*No degree*			
	High school/GED	1.19(.28)	.18	.75-1.9
	Bachelor's/other	1.94(.57)*	.67	1.1-3.44
	Master's/Doctorate	2.2(.91)	.79	.98-4.94
	Under 16 Inappl	.20(.24)	-1.60	.02-2.1
Insurance	*Private*			
	Public	.95(.20)	-.05	.63-1.44
	Uninsured	.42(.32)	-.88	.09-1.84
Ins coverage	*18-24 months*			
	12-17 months	1.17(.45)	.14	.54-2.47
	6-11 months	1.36(.65)	.31	.54-3.45
	0-6 months	1.4(1.0)	.33	.32-5.95
Diagnosis	*Mental health*			
	Medical only	.78(.16)	-.25	.51-1.18
	No diagnosis	.81(.22)	-.22	.48-1.36
Health	*Excellent*			
	Very good	.92(.24)	-.09	.55-1.52
	Good	1.25(.33)	.23	.75-2.11
	Fair	1.71(.52)	.54	.94-3.12
	Poor	2.33(.90)*	.84	1.1-4.95
Mental health	*Excellent*			
	Very good	1.82(.47)*	.60	1.09-3.02
	Good	1.98(.51)**	.68	1.2-3.26
	Fair	1.8(.51)*	.57	.99-3.12

	Ref group in italics	LR X² statistic (df=36)		
		OR (SE)	Coefficient	95% CI
	Poor	1.55(.60)	.44	.72-3.29
Activity limits	No			
	Yes	2.58(.69)**	.95	1.52-4.37
Social limits	No			
	Yes	.89(.27)	-.12	.49-1.6
Psychotropic	No			
	Yes	1.49(.27)*	.40	1.04-2.12
Appt difficulty	Very difficult			
	No difficulty	.97(.18)	-.03	.67-1.39
Phone difficulty	Very difficult			
	No difficulty	.90(.16)	-.12	.62-1.27
Provider listens	No			
	Yes	.85(.40)	-.16	.34-2.13
Confident in	No			
Provider	Yes	2.16(.90)	.77	.96-4.87
Satisfaction with	Not satisfied			
provider/staff	Satisfied	2.10(.79)*	.74	1.0-1.4
Satisfaction w	Not satisfied			
quality of care	Satisfied	.23(.14)*	-1.48	.07-.74
Model R² =.27				

Probability of obtaining a X² statistic at least as large at random: *p<.05 **p<.01

The satisfaction variables that will be discussed below did not emerge as strong predictors of the probability of more than one visit. However a relationship is sometimes not clearly evident if it changes over levels of a third variable. To assess for interaction effects multiplicative terms were created for each satisfaction variable and each level of gender, race, education, insurance, health and mental health since these could moderate the relationship between satisfaction and the probability of a subsequent visits. The terms were entered individually into each of the three main effects models. An interaction is present if the coefficient of the interaction term is statistically significant. A significant interaction term indicates a difference in the effect of that level of the dummy variable compared to the omitted reference group. The following sections address the

main effects and significant interactions found for each of the six satisfaction variables in models predicting more than one visit, more than two visits and more than three visits. Differences between un-weighted and weighted models is addressed.

Satisfaction with quality of care

The main effects model for the probability of more than one visit indicates satisfaction with quality of care is a significant predictor (Table 6). The direction, consistent in both weighted and un-weighted models, was unexpected. Individuals who report high satisfaction with quality of care were 80% less likely to have more than one visit ($p<.05$). Satisfaction with quality of care was not significant for the probability of more than two visits or more than three visits. Interaction terms indicate the relationship between satisfaction with quality of care and the probability of a subsequent visit may be moderated by race, education, age and diagnosis. This means that for one or more levels of each moderating variable, satisfaction with quality of care may have a negative (smaller or weaker) or positive (larger or stronger) effect on the probability of a subsequent visit compared to the other levels of the same variable.

Table 7 shows interaction terms that were significant in both un-weighted and weighted interaction models. The relationship between satisfaction with quality of care and the probability of more than one visit was 93% weaker for African Americans as compared to white and Hispanic groups and 61% stronger for females compared to males. The effect of satisfaction with care on the probability of a subsequent visit is 96% weaker for individuals with a high school education and considerably stronger for individuals with college. The effect of diagnosis on the strength of the relationship between satisfaction

with quality of care and the probability of a subsequent visit is 33% larger among individuals with a mental health diagnosis compared to individuals with a medical diagnosis only or no diagnosis. It was 83% weaker for individuals having a medical diagnosis only. The effect of health on satisfaction with quality of care was 98% weaker for individuals reporting excellent or very good health compared to respondents reporting poor health.

Table 7 Significant interactions with satisfaction with quality of care in weighted and un-interaction weighted models

Main effects	Significant interaction effects	% Net effect of satisfaction with quality of care on probability of subsequent visit		
		MT1vis	MT2vis	MT3vis
Un-weighted analytic models				
Sex	Female			0.61*
Race	Black			-0.93*
Age	25-44		$-0.05^{\dagger}$	
Education	High School	-0.96*		
	College	0.19*		
Weighted analytic models [a]				
Race	Black			-0.96*
Age	25-44			-0.90*
Education	High school	$-0.92^{\dagger}$		
	College	2.10**	$1.62^{\dagger}$	
Diagnosis	Mental health		0.05*	0.33*
	Medical only			$-0.83^{\dagger}$
Health status	Excel/very good	-0.98**		

* $p<.05$ ** $p<.01$ †approached $p<.05$ [a] variance estimation and sampling weights

Satisfaction with quality of care seems to be a significant predictor of more than one visit, but the direction of the relationship was unexpected. The direction suggests being highly satisfied with the quality of care decreases the probability of a subsequent visit. One interpretation is that being satisfied with quality of care after the first visit equates to a individuals having obtained a desired outcome and no longer needing the service.

This lends support for the notion that individuals who only have one visit are indeed satisfied with the available outcomes for information and reduced uncertainty independent of treatment. Another possibility is that the variable is picking up the effects of the health care portion of the health to mental health utilization ratio. The cases are weighted towards individuals with less complex medical problems for which easily satisfied outcomes are more obtainable after one visit. This was tested by estimating the model without the visit weights. The change had no effect on the direction or significance of satisfaction with quality of care. In addition to the negative relationship, interaction models suggests the extent to which satisfaction with quality of care is an important predictor of a subsequent visit varies by race, education, diagnosis and health status.

Satisfaction with provider/staff

The main effects model indicates satisfaction with provider/staff is a significant predictor of more than one visit with individuals highly satisfied with provider/staff being more than twice as likely to have more than one visit (p<.05) (Table 6). In the weighted model individuals satisfied with provider/staff were two times as likely to have more than two visits (p<.05)(not shown). Interaction models indicate the relationship may be moderated by age, education, health and insurance coverage (Table 8). When age is 25-44 the effect of satisfaction with provider/staff on the probability of more than one visit is 19% weaker than for other age groups. The main effects model stratified by age in a separate analysis (Table 27 Appendix B) suggests individuals age 25-44 satisfied with provider/staff are 50% less likely to have more than two visits while individuals age 45-64 are over six times more likely to have more than two visits. The effect of

satisfaction with provider/staff on the probability of more than two and more than three visits is 47% larger for individuals with a mental health diagnosis and for excellent/very good health in predicting more than three visits. The effect of satisfaction with provider/staff on a subsequent visit was stronger for individuals with an advanced degree and individual sin excellent/very good health. The effect was 71% weaker among privately insured individuals. In summary satisfaction with provider/staff is a positive predictor of more than one visit and more than two visits with significant differences in effect for age, diagnosis, health and even insurance across all three models.

Table 8 Significant interaction effects with satisfaction with provider/staff care in weighted and un-interaction weighted models

Main effects	Significant interaction effects	% Net effect of satisfaction with provider/staff on probability of subsequent visit		
		MT1vis	MT2vis	MT3vis
UNWEIGHTED				
Diagnosis cat.	Mental health		$1.35^{\dagger}$	0.47*
Health status	Excel/very good			**1.88***
WEIGHTED [a]				
Age	25-44		-0.28*	$-0.19^{\dagger}$
Education	Advanced degree	22.08*		
Health status	Excel/very good			6.99*
Insurance coverage	Privately insured			-0.71*

* p<.05   ** p<.01   †approached p<.05   [a] variance estimation and sampling weights

Provider listens

Provider listens was not a significant predictor of a subsequent visit in un-weighted or weighted main effects models (Table 6). Several interaction terms were significant. Table 9 shows interactions between provider listens and education, diagnosis and health. The effect of whether the provider listens on the probability of a subsequent visit was greater for individuals with college but was 78% weaker for individuals with a high school education. Provider listens had 65% less of an effect on the probability of a subsequent

visit for individuals with a medical diagnosis than individuals with a mental health diagnosis and 84-90% less of an effect for individuals in excellent/very good compared to individuals in poor health. Even though provider listens was not significant in main effects models, interaction terms are largely consistent with the pattern of interactions found with the two previous satisfaction variables.

Table 9 Significant interaction effects with provider listens in weighted and un-weighted models

Main effects	Significant interaction effects	% Net effect of provider listens on probability of subsequent visit		
		MT1vis	MT2vis	MT3vis
UNWEIGHTED				
Education	College		2.55[†]	
	Excel/very good	-0.84*		
WEIGHTED [a]				
Education	High school	-0.78*		
	College		4/57[†]	
Diagnosis category	Medical only		-0.65*	
Health status	Excel/very good	-0.90**		

* p<.05   ** p<.01   [†]approached p<.05   [a] variance estimation and sampling weights

Confidence in provider

Confidence in provider was a positive predictor of more than one visit in the weighted model (p<.05) (Table 25 in Appendix B) and approached significance in the un-weighted model (Table 6). Individuals with confidence in the provider were over twice as likely to have more than one visit than individuals not confident in the provider. Table 10 shows significant interaction effects with confidence in provider for education, diagnosis, health and insurance. The effect of confidence in provider on the probability of a subsequent visit was between 9% and 63% weaker for individuals with a high school education in both weighted and un-weighted estimates and across all visits. The effect of confidence in the provider was 300-500% stronger for individuals with college. The

importance of confidence in provider was 60% less for individuals with a medical diagnosis as compared to individuals with a mental health diagnosis. The effect was 10% greater for individuals reporting excellent/very good health. Interaction terms from the weighted model indicate the importance of having confidence in the provider is greater for individuals with private insurance and between 38% and 96% less important for uninsured.

Table 10 Significant interaction effects with confidence in provider in weighted and un-weighted models

Main effects	Significant interaction effects	% Net effect of confidence in provider on probability of subsequent visit		
		MT1vis	MT2vis	MT3vis
UNWEIGHTED				
Education	High school	-0.09*	-0.55**	-0.44*
	College		4.60*	3.29*
Diagnosis category	Medical diagnosis			-0.59*
WEIGHTED [a]				
Education	High school		-0.63**	-0.58†
	College		5.20*	4.21*
Health status	Excel/very good	0.10*		
Insurance coverage	Private ins			1.67†
	Uninsured	-0.38*		-0.96**

* p<.05   ** p<.01   †approached p<.05   [a] variance estimation and sampling weights

Appointment difficulty/ Difficulty contacting provider by phone

Appointment difficulty and telephone difficulty were not significant predictors of a subsequent visit in either weighted or un-weighted models and I question whether they belong in the models as a measure of satisfaction. However, interaction models do indicate significant differences in the importance of these two variables by education, race and insurance that is noteworthy. Table 11 indicates the importance of not having difficulty obtaining an appointment in the probability of a subsequent visit was 60% to

80% less important for individuals with higher education. For individuals with private insurance and no insurance the effect of appointment difficulty in predicting a subsequent visit is negative, but for individuals with public insurance the effect is significantly stronger in predicting a subsequent visit. Separate stratified models suggest publicly insured individuals who report no appointment difficulty are almost two and a half times more likely to have more than three visits than individuals who report appointment difficulty (p<.05).

Difficulty contacting the provider by phone was significantly more important for the Hispanic group compared to white and African American groups. The net effect from interaction models suggest the effect 98% to 152% greater for Hispanic individuals (Table 12). Separate models stratified by race found Hispanics who report no phone difficulty were five to seven times more likely to have more than two and more than three visits than Hispanic individuals who reported phone difficulty (p<.05). The effect does not appear to be the result of small sample. These findings are concerning because they suggest barriers to obtaining care such as difficulty getting an appointment or difficulty contacting provider by phone may discourage care more for some groups such as Hispanic and publicly/uninsured groups. At the very least the findings suggest language problems for Hispanic individuals may pose greater unique barriers to care via telephone access than for English speaking groups.

Table 11 Significant interaction effects with appointment difficulty in weighted and un-weighted models

Main effects	Significant interaction effects	% Net effect of difficulty getting an appointment on probability of subsequent visit		
		MT1vis	MT2vis	MT3vis
UNWEIGHTED				
Education	Advanced degree		-0.74**	
Insurance	Private ins			-0.13†
	Public ins			0.81†
WEIGHTED [a]				
Education	Advanced degree		-0.84**	-0.63†
Insurance coverage	Public insurance		.82†	1.35**
	Uninsured		-.73*	

* p<.05 ** p<.01 †approached p<.05 [a] variance estimation and sampling weights

Table 12 Significant interaction effects with telephone difficulty in weighted and un-weighted models

Main effects	Significant interaction effects	% Net effect of telephone difficulty on probability of subsequent visit		
		MT1vis	MT2vis	MT3vis
UNWEIGHTED			0.98*	
Race	Hispanic			
WEIGHTED [a]		1.47*	1.52*	
Race	Hispanic			

* p<.05 ** p<.01 †approached p<.05 [a] variance estimation and sampling weights

Summary

The first hypothesis suggested there would be a relationship between satisfaction with care and the probability of more than one, more than two and more than three visits. The findings suggest there is a relationship between satisfaction and the probability of a subsequent visit in several models. There were significant main effects for satisfaction with quality of care although the direction was surprising. There were significant main effect for satisfaction with provider/staff in models both with and without analytic weights. There were significant main effects for confidence in provider primarily in models which used the analytic weights. There were no main effects for provider listens,

difficulty getting an appointment, or difficulty containing provider by phone. Significant findings in main effects models were primarily in predicting more than one visit with little or no significance thereafter which would indicate that the greatest differences in the sample are between those with only one visit and those who with more than one visit. There were a greater percentage of respondents with one visit who had less education, better mental and physical health, fewer mental health diagnoses, fewer activity and social limitations, less psychotropic medication and more private insurance, but this did not differ dramatically from the differences seen between other visits.

The interaction models detected greater between group differences in the effects of each satisfaction variable on the probability of a subsequent visit particularly for the probability of more than three visits. With each satisfaction variable there was a strong pattern of interaction effects for education, health and diagnosis, race, age and insurance. In this analysis, I examined the relationship between satisfaction and the probability of a subsequent visit focusing on the first four visits since that is when 46% of the sample is lost. The next task was to model the relationship between satisfaction and level of use with the added precision of a targeted population of respondents with depression and a compliance measure constructed from the minimum number of visits and number of prescriptions set forth in depression treatment guidelines.

A split sample test of robustness was performed for the main effects model predicting more than one visit 1) to evaluate the effect of retaining the left censored cases and 2) as assurance that respondents beginning care in Round 2 and Round 3 were not evaluating satisfaction differently since their evaluations came very early in care.

There were no differences in the direction or magnitude of any of the coefficients using just left censored/Round 1 cases compared to Round 2 and Round 3 cases. The sample was also split to evaluate the influence of truncated cases on the relationship between satisfaction and the probability of a subsequent visit. The sample was too small to run for the truncated cases alone (N=116) so I compared cases not truncated with the entire sample and there were no differences in the strength or magnitude of the coefficients.

Satisfaction and probability of depression treatment compliance

A weakness in the previous analytic models is not being able to distinguish individuals who received consultation without treatment or who received brief treatment from respondents who required but did not complete treatment. The second hypothesis explored this further by testing the assertion that there would be a relationship between satisfaction with care and treatment compliance among a subgroup of respondents with a diagnosis of depression. This section will first change the specifications in the previous three analytic models to include only the depressed cohort. This will illuminate any differences in the depressed cohort without respect for whether they were complaint. Second, this section will describe differences between compliant and noncompliant depressed respondents in terms of number of visits and antidepressant prescriptions. The covariates used earlier will be re-evaluated for their contribution to a logistic regression model estimating the relationship between satisfaction with care and the probability of compliance and a reduced model will be used that supports the smaller sample size of depressed cohorts.

Without respect for whether they were compliant the cohort of depressed patients was examined for predictors of a subsequent visit. The model was significant $p<.0001$(Table 13). In the depression cohort females and individuals with college were significantly more likely to have more than one visit. Hispanic and African Americans were significant less likely to have more than one visit. The group of respondents with depression were significantly more likely to report poor health. Depressed respondents

who were satisfied with the quality of care were 95% less likely to have more than one

visit than depressed respondents not satisfied with the quality of care. Respondents who

were satisfied with provider/staff were three and a half times more likely to have more

than one visit. The depressed group was different from the total sample in the following

ways: Being Hispanic or African American reduced the likelihood of a subsequent visit;

being in poor health increased the likelihood of having more than one visit six-fold in

the depressed group compared to two fold in the total sample. Having poor mental

health did not increase the likelihood of having more than one visit for the depression

group whereas poor mental health was positive and significant in the total sample.

Perhaps this was because the entire subgroup had poorer mental health. Being publicly

insured doubled the chances of having more than one visit. Being satisfied with

provider/staff increased the probability of more than one visit almost three and a half

times for the depressed cohort compared to two times for the total sample. Satisfaction

with quality of care reduced the probability of more than one visit for both groups.

Table 13 Main effects model of the relationship between satisfaction with care and the probability of more than one visit for the depression subgroup

		LR X^2 statistic (df=30)		
		OR (SE)	Coefficient	95% CI
Sex	*Male*			
	Female	2.94(.80)**	1.07	1.7-5.0
Race	*White*			
	Hispanic	.43(.15)*	-.84	.22-.85
	Black	.31(.15)*	-1.18	.12-.79
Age	*25-44*			
	18-24	.52(.24)	-.65	.21-1.3
	45-64	.83(.24)	-.18	.48-1.46
	65-90	.82(.29)	-.20	.41-1.67
Education	*No degree*			
	High school/GED	.98(.34)	-.02	.50-1.9
	Bachelor's/other degree	2.70(1.2)*	.99	1.13-6.4
	Master's/Doctorate	5.60(1.55)	.95	.80-8.4
Insurance	*Private*			
	Public	2.1(.75)*	.74	1.04-4.22

	Uninsured	.73(.41)	-.32	.24-2.22
Health	*Excellent*			
	Very good	1.16(.49)	.15	.51-2.6
	Good	1.55(.65)	.44	.68-3.53
	Fair	4.8(2.4)**	1.58	1.84-12.7
	Poor	6.26(3.9)**	1.83	1.8-21.3
Mental health	*Excellent*			
	Very good	1.45(.71)	.37	.55-3.8)
	Good	1.3(.61)	.26	.52-3.24
	Fair	.77(.37)	-.26	.30-1.97
	Poor	1.8(1.15)	.59	.52-6.3
Activity limits	*No*			
	Yes	3.23(1.28)**	1.17	1.5-7.0
Social limits	*No*			
	Yes	.87(.41)	-.14	.35-2.2
Psychotropic	*No*			
	Yes	1.41(.40)	.34	.81-2.5
Appt difficulty	*Very difficult*			
	No difficulty	1.15(.32)	.14	.67-1.98
Phone difficulty	*Very difficult*			
	No difficulty	.88(.24)	-.13	.51-1.5
Provider listens	*No*			
	Yes	2.28(1.57)	.83	.59-8.8
Confident in Provider	*No*			
	Yes	1.6(1.1)	.47	.41-6.2
Satisfaction with provider/staff	*Not satisfied*			
	Satisfied	3.44(2.12)*	1.24	1.0-11.5
Satisfaction w quality of care	*Not satisfied*			
	Satisfied	.04(.04)**	-3.24	.004-.36
Model R^2 =.33				

Probability of obtaining a X^2 statistic at least as large at random: *p<.05 **p<.01

As shown above to compare differences between the depressed cohort and the total sample I simply re-estimated the probability of more than one visit to include only the depression subgroup, but the hypothesis actually calls for estimating the probability of compliance for the depressed cohort. The compliance outcome measure was constructed such that respondents with a diagnosis of depression who had less than six visits or received fewer than four antidepressant prescription are considered noncompliant. A drawback is that using minimal treatment standards does not taken into account partial compliance such as receiving three of four prescriptions or having five instead of six visits. *T*-tests were performed comparing the mean number of visits and prescriptions

between compliant and noncompliant patients (Table 14). Noncompliant individuals had fewer visits and received an average fewer antidepressant drug prescriptions. Compliant patients had a wide range of visits so the distribution was examined indicating 50% had fewer than 15 visits and 75% had fewer than 27 visits[6].

Table 14 Differences in visits and medication between compliant and non compliant respondents

	Compliant Mean (SD)	95% CI	Non-compliant Mean (SD)	95% CI	t statistic (df)
Visits	23.5(26.9)	21-26	2.36(1.4)	2.2-2.5	-13.62 (753)*
Prescriptions	12.7(7.5)	11-14	2.2(1.2)	2.0-2.4	-14.08(282)*

* Significant at p<.05

A reduced regression model was fit for the depression subgroup predicting treatment compliance because of the reduction in sample size. As before a process of variable selection was done and forward selection procedures carried out to learn which variables contributed to the new model. The group of sociodemographic variables did not contribute significantly to the model. Race was the only sociodemographic variable that was significant. The group of impairment variables were significant at p<.0001. Individually, health, psychotropic drug and activity limitations were significant additions to the model at p<.05. The group of satisfaction variables contributed significantly to the model at p<.05. Individually, only the contribution of appointment difficulty and phone difficulty to the model approached significance at p<.05. The full model made no further contribution over the reduced model and the reduced model had the advantage of not reducing power lost from the 30% reduction in sample size due to selection of depression subgroup analysis. The reduced model containing race, age, health, activity

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[6] *T* tests and comparisons were made before omitting non-depression ICD9 '296' and '300' respondents

limitations, satisfaction variables and analytic weights is shown in Table 15. The reduced

model was significant at p<.0001. Only confidence in provider was significant and the

direction of the coefficient was negative such that having confidence in the provider

reduced the likelihood of compliance. Also note the direction of satisfaction with quality

of care which, although not significant, was now positive. This was seen in a separate

stratified model which found the direction of satisfaction with quality of care predicting

compliance was positive and significant for individuals having a high school

education/GED which for the compliance group made up 44% of the sample.

Table 15 Reduced logistic model of the relationship between satisfaction with care and the probability of depression treatment compliance

	Ref group in italics	LR X² statistic (df=18)		
		OR (SE)	Coefficient	95% CI
Race	*White/black*			
	Hispanic	.42(.24)	-.87	.14-1.28
Age	*25-44*			
	0-17	.50(.31)	-.69	.15-1.7
	18-24	1.01(.52)	.01	.37-2.8
	45-64	1.02(.36)	.02	.51-2.03
	65-90	.56(.25)	-.58	.23-1.35
Health	*Excellent*			
	Very good	1.65(.65)	.49	.75-3.6
	Good	2.4(1.28)	.87	.83-6.9
	Fair	3.11(1.7)*	1.14	1.0-9.2
	Poor	4.8(2.61)*	1.57	1.6-14.0
Activity limitations	*No*			
	Yes	1.67(.60)	.51	.82-3.4
Appt difficulty	*Very difficult*			
	No difficulty	1.3(.47)	.27	.65-2.6
Phone difficulty	*Very difficult*			
	No difficulty	.85(.25)	-.16	.48-1.5
Provider listens	*No*			
	Yes	1.73(1.1)	.54	.49-6.05
Confident in provid	*No*			
	Yes	.08(.10)*	-2.5	.007-.90
Satisfaction with provider/staff	*Not satisfied*			
	Satisfied	15.2(.78)	.42	.55-4.2
Satisfaction w quality of care	*Not satisfied*			
	Satisfied	4.37(5.4)	1.47	.39-49.

*p<.05

Interaction terms were added individually into the main effects model. Psychotropic drug was significant in both weighted and un-weighted models for compliance (Table 16). The effect of satisfaction with quality of care and having confidence in the provider was weaker for respondents on a psychotropic drug. The finding did not seem to result from differences in the depressed cohort which were shown earlier to be similar to the total sample. To test this further, the reduced model was run for the probability of more than five visits to see if the change in the direction of the relationship was related to number of visits. Satisfaction with quality of care and confidence in provider were not significant, but the direction of the coefficients was consistent with the compliance model with satisfaction with quality of care being positively related to compliance while confidence in provider being negatively related to compliance. To test for model misspecification that could have resulted from the reduced model, the reduced model was estimated for the entire sample predicting more than one visit to see if the direction/strength of the coefficients changed. The reduced model predicting more than one visit, even without controlling for gender, education, insurance or mental health produced estimates that were identical to that produced by the full model predicting more than one visit. This means that model misspecification from the reduced model is not the cause for differences in the estimates predicting compliance.

Table 16 Significant interaction effects for compliance in un-weighted models

Main effects	Significant interaction effects	% Net effect on probability of treatment guideline compliance
		COMPLIANCE
UNWEIGHTED		
Psychotropic Rx	x Satisfaction with quality of care	.41*
Psychotropic Rx	x Confidence in provider	.90*

* p<.05

Summary

It seems that time, e.g., having more than five visits, more than the condition, e.g., depression, or the effect of a reduced model was responsible for changes in the direction of the relationship between satisfaction variables and the probability of compliance. There appears to be characteristics unique to the population having more than five visits, aside from a depression diagnosis, that account for the finding. Aside from the negative relationship between confidence in the provider and probability of compliance, there was a significant interaction between confidence in provider, satisfaction with quality of care and psychotropic drug. The effect of confidence in provider an satisfaction with quality of care were weaker for individuals on a psychotropic drug. This was the finding in a separate stratified analysis which found among individuals on a psychotropic drug confidence in provider had a significantly reduced effect on the probability of compliance (Table 32). This implies confidence in the provider matters less among individuals on a psychotropic drug. Perhaps this is because individuals place their confidence in the drug treatment.

Satisfaction with care and time-to-failure rates

Thus far the analysis has centered around satisfaction with care and the probability of continuation in the first four visits and the probability of treatment guideline compliance at six visits. This still leaves questions about whether a relationship can be detected across a wider interval of visits. The previous model predicting depression treatment compliance hinted that the relationship between satisfaction and the probability of a subsequent visit may not be constant across visits. To test the hypothesis that rates of dropout across the duration of care are influenced by satisfaction with care, survival or time to failure methods were used to compare failure rates of satisfied and not satisfied patients. Survival methods are used in research to determine the probability and timing of an event such as dropout to occur. The survival 'function' is the probability that the duration until an event occurs is of at least length t. The rate at which the duration is completed after length t, given that they lasted at least until t is called the hazard rate and indicates the failure potential (Kleinbaum, 1996). The higher the hazard rate the lower the probability of surviving. For this analysis time to dropout is the outcome variable of interest and satisfaction variables are the predictors.

Data on 18,000 mental health visits by 1,430 individuals was converting to survival time data using the stset command in STATA. The distribution of failure times was estimated across the sample using sts graph. The functional shape of the hazard function was identified as an increasing Weibull because the potential for dropout increases as the number of visits increase. The survivor function which estimates the probability of survival over time indicates 75% of the study population returned after the first visit, less than 50% returned beyond the sixth visit and 20% returned beyond 20 visits.

Kaplan-Meier estimator curves were used to explore differences in the conditional failure rates predicted by each satisfaction variable. There were only slight differences in the survival function between high and low satisfaction for satisfaction with provider/staff, confidence in provider, appointment difficulty and phone difficulty. There were larger differences in the survivor function between satisfaction with quality of care and provider listens. For example the failure rate when provider listens was 73% as compared to 79% when the provider does not listen. Satisfaction with quality of care shows the same negative relationship with continuation as seen in the first analytic models. The survival rate for individuals who were satisfaction with quality of care was 72% as compared to 83% for individual not satisfaction with quality of care.

The Kaplan-Meier curves were compared for statistical differences using the log-rank test which is a large sample chi-square test that uses expected versus observed cell counts over categories of outcomes to evaluate between group differences in survival functions. The survival curves did not differ significantly with the exception of provider listens ($p<.05$). Kaplan-Meier survival curves crossed for each of the variables which suggested that control variables were needed. The log rank test was again used to evaluate the effects of control variables on each of the six satisfaction variables. There were significant differences in the survival functions of satisfaction with provider/staff for males, individuals with a high school education, private insurance coverage, a medical diagnosis only and individuals in poor health. There were significant differences in the survival function of provider listens for individuals with college, for the age group 45-64 and individuals with a medical diagnosis only.

To control for the effects of gender, race, age, education, insurance, diagnosis, health, mental health, psychotropic drug and truncation (study attrition), adjusted survival curves were used. The sample was also capped at less than 25 visits to reduce the influence of extreme outliers (Edlund et al., 2002). The adjusted curves indicate differences in the effect of satisfaction on survival is not constant with respect to number of visits. For example, satisfaction with quality of care appears to have its greatest impact on the survival rate among persons with between five and 15 visits (Figure 2). Whereas earlier findings suggested that high satisfaction with quality of care was associated with high dropout in the first four visits, this analysis suggests dropout is lowest for individuals who are highly satisfied with quality of care with particularly large differences between 5 and 15 visits. This finding was conditional on controlling for age, health and insurance coverage. Without these three control variables the effect on satisfaction mimics earlier findings where high satisfaction with quality of care reduced the probability of continuation of care[7]. For satisfaction with provider/staff the differences occur between two and eight visits but with a wide band of differences across the duration of care (Figure 3). Consistent with earlier findings high satisfaction with provider/staff has a higher survival rate. Differences in provider listens has its greatest effect for persons who have between six and ten visits (Figure 5). The narrow band suggests few differences in survival rate when provider listens. This is consistent with

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[7] At less than 10 visits high satisfaction with quality lowers the survival rate with or without controlling for age, insurance and health. At less than 15 visits high satisfaction with quality increases the survival rate with or without age, insurance and health. At less than 20 visits there is no difference between high and low satisfaction with quality without age, insurance and health. With the control variables high satisfaction results in lower survival rate. At less than 26 visits high satisfaction results in higher survival rate without control variables. With the control variables high satisfaction results in a lower survival rate.

earlier findings of few significant differences in the first four visits or in the probability of compliance.

Because the survivor function for this data follows a Weibull distribution, a Weibull regression model was favored over a Cox Proportional hazards model. The model was fit with the six satisfaction variables and covariates were added to the model to capture adjusted estimates of the probability of discontinuation. The model was significant at $p<.0001$ (table not shown). In survival analysis the measure of effect obtained is called the hazard ratio which is the time-to-failure rate. As with logistic regression it is expressed in terms of an exponential of a regression coefficient. A hazard ratio of 1 means there is no effect. A hazard ratio of 10 means that an exposed group (highly satisfied) has ten times the hazard or failure rate of the unexposed group (not satisfied). A hazard ratio $1/10$ implies the exposed group (highly satisfied) has one-tenth the hazard of the unexposed group (not satisfied). In this model higher education, poor mental health and being on a psychotropic drug was associated with a decreased risk of dropout at $p<.05$ significance level. Truncation (leaving the study early) $(p<.01)$, having no diagnosis $(p<.01)$ and being African American $(p=.07)$ were associated with a higher risk of dropout. Having confidence in provider was associated with a decreased risk of dropout but this not quite significant $(p=.08)$. In a separate model not controlling for age, health and insurance, satisfaction with quality of care and confidence in provider both reach significance at $(p<.05)$ and resulted in no noticeable changes in the strength or direction of the hazard ratios.

The main effects survival model did not show significant effects for satisfaction. However, adjusted survival curves strongly suggest differences exists that might be explained through stratified models. A summary of the stratified models is shown in Table 34. Consistent with the previous analysis being satisfied with the quality of care decreased the chances of staying in treatment. The hazard ratio was consistently > 1 across most groups. Individuals age 45-64 who were satisfied with quality of care were nine times more likely to leave care than individuals in the same age group not satisfied with quality of care (Figure 6). Having a medical diagnosis only (Figure 7) or advanced degree were also associated with a higher hazard ratio. Individuals with an advanced degree had 50 times the hazard rate of individuals with an advanced degree not satisfied with quality of care (Figure 8). The hazard ratio was <1 for the Hispanic group, publicly insured individuals and individuals age 25-44 however the results were not statistically significant. Satisfaction with provider/staff was associated with a decreased risk of dropping out for individuals in the 45-64 age category (Figure 9) and for individuals with an advanced degree (Figure 10). Being satisfied with provider/staff was associated with a higher risk of dropping out for individuals in excellent/very good mental health (Figure 11). In the analytic model predicting more than two visits this group were statistically less likely to drop out.

Unlike the previous analysis which found the probability of a subsequent visit only weakly affected by the variables confidence in provider and provider listens, the survival model shows more pronounced differences for these variables on the failure rate. Being in good health and reporting confidence in the provider reduced the risk of dropout by 40% compared to individuals in good health who did not report having confidence in

the provider (Figure 12). For individuals with good mental health having confidence in provider reduced the risk of failure by 50% (Figure 13). Confidence in provider significantly decreased the failure rate for individuals age 45-64 (Figure 14), for individuals with an advanced degree (Figure 15), for individuals who were white (Figure 16) and for individuals with no diagnosis (p=.07) (Figure 17). For individuals with an advanced degree, provider listens also significantly decreased the failure rate (Figure 18). For individuals with private insurance confidence in provider reduced the failure rate by 30% (p=.07) (Figure 19). Provider listens was associated with a 60% reduction in the failure rate for African Americans (Figure 20). The hazard rate was significantly increasing for only one group: Provider listens was associated with an increased risk of failure for individual in good health (p<.05) (Figure 21).

Summary

In summary the time to failure rates for respondents with high satisfaction and low satisfaction were not statistically different in the main effects model, but there were several statistically significant differences revealed between groups. With few exceptions the findings were consistent with logistic regression models in the previous analysis with additional findings on provider listens not previously found. There is sufficient support for the hypothesis that failure rates between high and low satisfaction are different for African Americans and whites, individuals in excellent health and mental health, age 45-64 and individuals with an advanced degree. As seen before the direction of the relationship is not always consistent. Differences in the finding from this model as compared to others may be attributed to 1) the use of slightly different set of covariates, 2) omitting outliers with more than 25 visits, 3) differences in the outcome of interest

failure rate over the duration of care versus probabilities of a second, third or fourth visit, or 4) the use of stratified models without a priori evidence of interactions.

To summarize the three research hypotheses in this study there was evidence to suggest a relationship does exist between satisfaction with care and the probability of continuation. There were some main effects in the relationship. However, a more interesting story that emerged was the extent to which the importance of satisfaction in predicting continuation differed across the sample for each satisfaction variable. This was evident in both interaction and stratified models. The stratified models indicated very large differences, but unless there was a corresponding interaction effect, these were de-emphasized in the findings because of the greater risk of making of Type 1 error. Even with the more conservative approach of reporting primarily on the significant interaction effects there were still significant differences. A second interesting story comes from the negative direction of the relationship between satisfaction with quality of care and the probability of continuation beyond one visit. Based on the literature and the theory it was expected that the relationship between satisfaction with care and the probability of continuation would be positive for all six satisfaction variables, but this was not always the case. Finally to comment on the theoretical framework. Economic theory served as an adequate model for evaluating the relationship, but would have been greatly improved by testing satisfaction as a function of the type of treatment and the probability of continuation as a function of satisfaction. The final chapter provides further discussion of the findings and implications for research, policy and practice.

CHAPTER 6 Discussion/Implications

Major findings

The goal of this research has been to examine the relationship between satisfaction with care and treatment compliance. Noncompliance in the form of early termination from outpatient mental health care is a pervasive problem that transcends patient populations and clinical settings. Responsibility for the problem has been largely placed on the patient. Using an economic framework other plausible explanations emerge which suggest noncompliance is the patient's response to supply side factors. The supply side of mental health determines not only the costs and benefits of treatment, but the extent to which patient preferences are addressed in clinical trials and incorporated into clinical practice patterns. Costs and benefits have been well studied, but the notion that patient preferences play an influential role in decisions about continuation of care has received little attention. By examining the relationship between satisfaction as a measure of patient preferences and continuation with care as a measure of compliance this research has sought to investigate the possibility further. In this section I will provide an overview of major research findings, compare the findings with previous research, discuss strengths and weaknesses of the research design and performance of the satisfaction measure. Finally, implications for social work policy, research and practice are discussed.

The study finds strong support for the hypothesis that a relationship exists between satisfaction with care and continuation of outpatient mental health care. After controlling for sociodemographic characteristics and impairment, satisfaction had a statistically significant influence on the probability of more than one, more than two and

more than three visits. Satisfaction had a significant influence on time-to-failure rates and was significantly although not as clearly related to depression treatment compliance.

Most notably satisfaction with care does not appear to play the same role in predicting treatment continuation for everyone. Having confidence in the provider and being satisfied with the provider/staff increased the probability of a subsequent visit for those discontinuing care in the first four visits. Being satisfied with the quality of care reduced the probability of a subsequent visit for those discontinuing care in the first four visits with the sharpest differences between individuals having one visit and individuals having more than one visit. This suggests that for many individuals an important outcome is attained at the first visit for which individuals are satisfied reducing the probability of a subsequent visit. Having confidence in the provider reduced the probability of complying with the depression treatment guidelines for individuals on a psychotropic drug, but satisfaction with quality of care increased the probability of compliance for individuals with a high school/GED education. Kaplan Meier survivor curves indicate the greatest band of differences in the continuation rate of individuals who were satisfied and individuals not satisfied with care occurred as late as between 10 and 15 visits suggesting the relationship between satisfaction and the probability of continuation may depend on the number of visits already attained.

Although the sociodemographic profiles of individuals who discontinued care early did not differ dramatically from those who continued in care, the degree to which satisfaction affected the probability of a subsequent visit varied dramatically by education, age, health status, mental health diagnosis, age, insurance and race.

Satisfaction was particularly an important factor for the mental health population where individuals satisfied with provider/staff were three and a half times more likely to have more than one visit compared to twice as likely for the entire sample. Being satisfied with the quality of care and having confidence in the provider was significantly and consistently less important for individuals with a high school education and significantly more important for individuals with college. For African Americans, individuals age 25-44 and for individuals with a high school education the effect of satisfaction with quality was significantly less important in predicting continuation. Contrary to my early questions of the validity of telephone difficulty and appointment difficulty questions, there were some interesting findings. Not having difficulty contacting the provider by phone significantly increased the likelihood of having more than two and more than three visits for the Hispanic group. Similarly, not having difficulty getting an appointment increased the likelihood of having more than two and more than three visits for individuals who were publicly insured, but was significantly less important for individuals with a Master's degree or greater, privately insured and uninsured individuals.

The findings in this study with regard to mental health utilization rates were consistent with previous research. For example, Olfson & Pincus (1994a) found 15% of individuals with at least one visit had more than 20 visits. The current study found 19% of individuals with one visit had more than 20 visits. Kendall & Sugarman (1997) report 23% of patients dropout after the first visit and 70% dropout by the tenth session. The current study found 23% dropout after the first visit and 66% dropout by the tenth visit. Low mental health utilization among African Americans has been demonstrated in past studies (Hu et al., 1991; Wierzbicki & Pekarik, 1993; Grunebaum et al., 1996; Swartz et

al., 1998). These findings were supported in the current data where African Americans had the fewest number of visits on average and had a very low probability of a subsequent visit in almost every analytic model.

Previous studies have found females to be heavy utilizers of outpatient mental health care (Horgan, 1983; K. Wells et al., 1986; Olfson & Pincus, 1994b; Frieman & Zuvekas, 2000). In this study females were more likely to have a subsequent mental health visit but males and females on average had the same number of visits. The percentage of males in the study population increased from 38% having more than one visit to 41% having more than 15 visits. Only males with a high school education or less, in poor physical/mental health, and males who were publicly insured/uninsured had a greater likelihood of a subsequent visit than females. Wang et al (2000) found males more likely than females to be compliant, but this finding was not supported in the depression treatment compliance group.

R. C. Kessler (1994) found the prevalence of mental disorder to be highest among individuals between 25 and 44 years old and declining thereafter. The current data found this age group had one of the highest average number of visits- second only to the 0-17 age group. However, satisfaction with care was not important in predicting a subsequent visit for 25-44 year olds and the effect of satisfaction was generally weaker for younger age groups. Being older has been previously associated with greater satisfaction (Hoff et al., 1999; Fontana & Rosenheck, 2001). Satisfaction was a very important predictor for the 45-64 age group who had almost as many visits on average as 25-44 year olds but for whom satisfaction with care was a very significant predictor. The elderly have been

previously shown to be particularly reluctant to use mental health care. This is consistent with the oldest age group in the sample where individuals 65-90 had the lowest average number of visits even among the depression treatment compliance sub-group. Nonetheless in the first 15 visits, the proportion of 65-90 year olds still increased from 13.8% having more than one visit to 17% having more than 15 visits.

Higher education has been associated with increased mental health use (Frieman & Zuvekas, 2000; Mueller & Pekarik, 2000) and greater compliance (Wierzbicki & Pekarik, 1993; Centorrino et al., 2001). In the current sample individuals with a bachelor's or advanced degree had the greatest number of visits than almost any other group with 16 and 19 visits respectively. In the depression treatment compliance subgroup individuals with an advanced degree had on average 25.9 visits- far more than individuals reporting even the most severe impairment at 19 visits. Although those with a higher education had more visits, individuals with a high school/GED education represented the largest proportion in the sample and made up the greatest percentage of individuals who were compliant at 44%. Among individuals with college having confidence in the provider was a particularly significant predictor of a subsequent visit but had a negative influence on the probability of more than one visit for individuals with a high school education. Similarly, satisfaction with quality of care was an important predictor for individuals with college, but was a significantly less important predictor for individuals with high school. Satisfaction with provider/staff was significantly more important in predicting more than one visit for individuals with an advanced degree compared to all other levels of education.

Mental health use has been associated with insurance coverage with lack of coverage thought to impede access to mental health care. In the current data individuals with public insurance had the greatest average number of visits while the privately insured individuals had the fewest number of visits. Satisfaction with care was predictor of a subsequent visit for privately insured and uninsured in stratified and interaction models. For publicly insured individuals confidence in provider was significantly less important in predicting a subsequent visit while having no appointment difficulty had a significantly stronger effect on the probability of a subsequent visit.

The literature suggests poor health is associated with a greater probability of any mental health use, but better health is associated with level of use. In the current sample individuals with poorer health, activity limitations, and a medical diagnosis had a greater average number of visits than individuals reporting better health, no activity limitations, and no diagnosis. This was not the case in the depression treatment compliance subgroup which found individuals reporting excellent health had as many visits as individuals reporting fair or poor health. Individuals in excellent health made up 65% of the sample having more than one visit but only 57% having more than 15 visits. Satisfaction with care was not a predictor of a subsequent visit for individuals in poor heath, but the effect of satisfaction was significantly weaker in predicting a subsequent visit for individuals in excellent health.

Mental status has been shown to be the strongest predictor of mental health use (Flaskerud & Hu, 1992; Landerman et al., 1994; R. C. Kessler et al., 1998). In the current data individuals reporting poor mental health and individuals with a mental health

diagnosis had the greatest number of visits. Individuals reporting poor mental health represented 40% of the population having more than one visit and increasing to 49% having more than 15 visits. Satisfaction with care was not a significant predictor of a subsequent visit for individuals in poor mental health, but it was a strong positive predictor for individuals with a mental health diagnosis. Satisfaction with quality of care had four times the effect on the probability of a subsequent visit for individuals with a mental health diagnosis whereas not having a mental health diagnosis significantly weakened the effect of satisfaction with quality of care on the probability of a subsequent visit.

Study strength and weaknesses

There are several significant limitations to this study. This section will summarize weaknesses and strengths of the design and measures. However, there are several general criticisms that can be made outright. The first concern called into question with any satisfaction study is that many respondents may be naturally inclined toward pessimism or optimism irrespective of their care experience. Evaluations of satisfaction with care would be terminally distorted by these overly positive or overly negative attitudes. This is thought to be especially problematic for the mental health population where many mental disorders are characterized by sadness, discontent and at the extreme perceptual and emotional disturbance. As was addressed in the literature there are researchers who question the validity of satisfaction measurement at all for mental health population. I do not subscribe to this view and find no support for in the data to indicate the measure was not valid. A second concern is the omitted variable problem that arises in all social

science research. The argument goes that because social science researchers operate outside a laboratory environment and on human conditions, we can never be completely sure there is not some important variable operating that was not measured in the study. Scholars argue that because of the ever-present possibility of an omitted variable, an 'effect' such as suggested in this study can never really be demonstrated.

A major difference between this study and research previously carried out on satisfaction with care is the study design. This section discusses strengths and weaknesses of the study design, choice of outcome variables and performance of the satisfaction measure as a predictor of continuation. The secondary analysis of data from national probability studies is commonly used for mental health utilization research carried out in the U.S., but has not been used for research on satisfaction with care in health or mental health care. Employing a national sample for this study had two advantages. First, it yielded a larger sample than has been attained in previous satisfaction with care studies enabling a more detailed analysis. Second, it produced findings that are generalizeable to the U.S. population increasing the relevance across patient populations. There were six disadvantages. First, the extent to which respondent satisfaction evaluations of their mental health care were successfully isolated from their evaluations of health care experiences was unknown.

Second the patient satisfaction measure, while an industry standard, is not theoretically correct for evaluating patient preferences for treatment. Third, because I had no information to differentiate between treatments except those involving psychotropic medication the study could not focus on whether treatment type affected

either satisfaction with continuation rates. I could evaluate only whether satisfaction influenced continuation. Fourth, although MEPS provides comprehensive data on mental health utilization continuation of care rates are still an imperfect proxy for treatment compliance. Fifth, each visit in the study is presumed to be part of a single continuous episode of care. This is not likely given tight limits on number of visits imposed by most third party payers. Finally, there is the possibility that multiple providers were delivering care even within a single episode. For example, in mental health care a psychiatrist or family physician may prescribe the medication while a psychologist or social worker provides the psychological treatment.

Outcome

In this study the effect of satisfaction on continuation of care was evaluated against three different sets of outcomes: the probability of more than two, more than three and more than four visits, the probability of depression treatment compliance, and differences in the hazard rate between high and low satisfaction. This offered a snapshot of the effects of satisfaction in predicting continuation for consumers at different levels of use and findings suggests the relationship changes over level of use. When the level of use is low satisfaction with quality of care is a significant negative predictor and confidence in the provider is a significant positive predictor. For individuals consuming more than five visits having confidence in the provider reduces the probability of continuation while satisfaction with quality becomes a positive predictor with high satisfaction with quality having its greatest impact on continuation for individuals consuming between 5 and 15 visits.

This suggests there are at least two distinct types of consumers of outpatient mental health services: those who discontinue care after one or two visits and those who continue. The effect of satisfaction is strongest predicting more than one visit and becomes weaker thereafter. This along with the finding that satisfaction with quality of care reduces the probability of more than one visit suggests that information and reassurance obtained from consultation alone may itself be a desirable end product for some individuals. At one visit the probability of returning is greater for individuals with confidence in the provider and satisfaction with provider/staff, but the probability is reduced for individuals satisfied with the quality of care. In contrast are individuals who continue care beyond the initial visits. Among individuals continuing care beyond five visits confidence in the provider had a significantly negative effect particularly among individuals on a psychotropic drug. Additionally the effect of satisfaction with the quality of care no longer reduced the probability of a subsequent visit beyond five visits, and for individuals with a high school education it significantly increases the probability of a subsequent visit.

Satisfaction measure

The satisfaction with care measure found patient satisfaction to be consistently and strongly important for individuals with the greatest need-- namely those with a mental health diagnosis. Satisfaction with care had a significantly weaker effect for those with the less need—individuals without a mental health diagnosis and individuals reporting better health and mental health. The consistency in the findings provide good support for the validity of the measure with the mental health population. There are several other

lessons with regard to the satisfaction measure that are discussed in this section. First, satisfaction with care had little effect beyond the probability of more than one visit in the main effects models. This is consistent with research findings from consumer and marketing literature which finds customer satisfaction measures do not perform well for pooled samples. This is because preferences, which often follow sociodemographic patterns, wash out in the aggregate. Interestingly this point never came up in the mental health satisfaction studies reviewed where design issues of global versus multidimensional measures were the focal point.

Second the satisfaction measure revealed important differences between sociodemographic groups in predicting a subsequent visit. The measure worked well for higher education, privately insured, but had no effect or had opposite effect for African American, individuals with less education and publicly insured. This suggests one of two possibilities. Either an outside factor was affecting continuation rates for some groups that were not controlled for in the analytic models such as income, family support or treatment type, or perhaps the satisfaction measure simply did not tap into the important questions for some groups. For example, 'quality of care' may be a culturally derived construct that does not measure well across income, education or race/ethnicity. The satisfaction variables which represented more practical aspects of care (telephone and appointment difficulty) were significantly more important predictors for these groups. This begs the question of whether the satisfaction with care is important at all to these groups, or whether it is important but inadequately represented by the measure.

Third the study overcomes three common measurement problems: Selection bias, acquiescence and discriminant validity. Selection bias is a common problem where sample losses due to dropout create a bias toward completers. This problem was overcome by using a household based survey which provided access to mental health users outside the treatment episode or setting. However, the choice of using a household sample where the satisfaction measure administered independent of a treatment episode came at the cost of specificity as individuals may have based satisfaction evaluations on non-mental health care experiences. The visit weights were constructed to minimize the influence of individuals who overall had a greater ratio of health care, but this was nonetheless a study weakness[8]. Acquiescence is another problem seen in previous research on satisfaction where responses are universally positively skewed. In this study responses were skewed toward high satisfaction but with the large sample and many control variables the measure still found differences in outcome. Finally in terms of validity the six questions that comprised the satisfaction measure appeared to discriminate between different aspects of satisfaction. Even questions that seemed conceptually closely related such as appointment and phone difficulty, and confidence in provider, satisfaction with provider/staff and provider listens measured as unique constructs. This provides support for satisfaction as a multidimensional measure, but still raises questions about whether the constructs used in this study are ones which are most important to patients in predicting future care.

Economic framework

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[8] This was examine further by re-estimating regression models to include those with only mental health visits finding the direction and strength of the coefficients to be unchanged.

The economic framework used in the study provided a compelling new way of understanding a very old problem. However the study design did not do justice to the model. First, the theoretical model calls for evaluating patient preferences and for this patient satisfaction is not a very useful proxy. Satisfaction measures do not typically account for opportunity costs—a key ingredient in revealed preference models. This means it is not enough to know if the patient is satisfied without knowing whether that aspect of care for which they were satisfied is important to them to begin with. Second, the data did not support enough information to evaluate supply side factors—such as type of provider and type of therapeutic intervention (other than medication). Third, additional data was needed in order to distinguish between separate episodes of care. This study employed rough measures only and could not eliminate left censored cases because of sample size reduction. Finally, the economic framework was not being empirically tested against any other model. Therefore I cannot make any comparative statement about its performance relative to other frameworks. The hypotheses might have been refined to test differences in effect of satisfaction within each subgroup since the interaction effects found were robust and might have included an income covariate.

Implications for research and policy and practice

There are broad implications from these findings that are relevant to practice, research and policy. The first is that consumers of mental health care are not a homogenous group in terms of decisionmaking about continuation of care. The research finds evidence of a distinct group of mental health consumers who terminate after only one visit apparently satisfied with the outcome. For others satisfaction with care is

important, but the role of satisfaction in predicting continuation still varies by sociodemographic factors, degree of impairment and level of use. The degree to which we understand the relationship between satisfaction with care and continuation with care is sensitive to conceptualization and measurement of satisfaction. This research suggests that for some groups practical aspects of care such as appointment and telephone access are more important in decisions about continuation than having confidence in the provider or being satisfied with provider/staff. Measuring patient satisfaction with care is important, but drawing out the divergent valuations for treatment and the treatment environment is even more important. Development of preference measures that account not only for whether the patient was satisfied with an aspect of care, but whether that aspect of care was important to begin with should be a central goal.

There are three recommendations for future research. First, the extent to which patients follow through with psychological treatments needs to be a central outcome measure in research on the efficacy, effectiveness and cost benefit of treatments. Second methodologies need to be developed to support measurement of treatment preferences and these methodologies utilized in research from which new treatments are developing. Third and even more fundamentally the use of economic theory to model the relationship between treatment method, satisfaction and compliance warrants further testing. Even in this study where the fidelity of the model fell short because of imperfect design and measures, the findings nonetheless suggest that decisions about continuation could, along with other factors, be a function of patient valuations for care. Further research might develop and test an econometric model of the demand for level of

outpatient mental health care using some other measure of patient valuations to predict demand.

Although there are boundless opportunities to use research to advance out knowledge of noncompliance and preferences for treatment, there are also important implications for practice. In the practice environment it is important to recognize that the application of global patient satisfaction measures serves little purpose because these do not reveal dissatisfaction with care. Satisfaction measures require redesign to yield useful feedback in the absence of large samples and that address the aspects of care that are important to less adequately served populations. Addressing preferences for treatments directly with patients in practice settings could reduce early termination for some, but given that patient preferences were not a key component in the development of existing treatments, addressing preferences among treatments patients might not have preferred to begin with may not yield any significant reduction in early terminations. Finally, from an administration perspective, elaborate mechanisms and standards for the labor intensive assessment and treatment planning of every patient when 40% may only be seeking information and reassurance may not be a practice that adds to the quality of outpatient mental health care. The costs and benefits of this practice need to be re-examined.

There are policy implications. The first is that the industry needs to capitalize on the informational value of economic behavior such as treatment noncompliance and other utilization patterns in the design of mental health care delivery systems. Noncompliance sends a strong message about the appeal of the mental health system beyond the initial

visits where the marginal value of care decreases rapidly. Better knowledge about what patients value most relative to what they value least could aid in the trade-off of resources that make up the mental health service delivery system. Concerns about underutilization of mental health care among underserved populations could also be addressed through more information about preferences of these individuals. This study had many weaknesses and serves only as a point of departure for more rigorous research into the role of patient preferences in treatment compliance beyond this study and to further investigate the usefulness of economic models in mental health.

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Appendix A

Table 17 Descriptive statistics for satisfaction with care

	Descriptives (N=1433)	
	Freq	Percentage
Appointment difficulty		
1 Not at all difficult	155	10.82%
2 Not too difficult	258	18.00%
3 Somewhat difficult	459	32.03%
4 Very difficult	531	37.06%
Missing	30	2.09%
Telephone difficulty		
4 Not at all difficult	156	10.91%
3 Not too difficult	223	15.59%
2 Somewhat difficult	474	33.15%
1 Very difficult	488	34.13%
Missing	89	6.22%
Provider listens		
1 Yes	1359	95.03%
2 No	55	1.12%
Missing	16	3.85%
Confidence in Provider		
1 Yes	1338	93.57%
2 No	78	5.45%
Missing	14	.98%
Satisfied with provider/staff		
1 Very satisfied	1000	69.93%
2 Somewhat satisfied	341	23.85%
3 Not too satisfied	55	3.85%
4 Not at all satisfied	23	1.61%
Missing	11	.77%
Satisfied with quality of care		
1 Very satisfied	1079	75.45%
2 Somewhat satisfied	291	20.35%
3 Not too satisfied	39	2.73%
4 Not at all satisfied	13	.91%
Missing	8	.56%

Appendix A Univariate/bivariate tables

Table 18 Descriptive statistics of sociodemographic characteristics

	Descriptives (N=1433)	
	Freq	P
Age		
1 0-4	14	0.98%
2 5-17	225	15.70%
3 18-24	92	6.42%
4 25-44	545	38.03%
5 45-64	406	28.33%
6 65-90	151	10.54%
Gender		
1 Male	546	38.10%
2 Female	887	61.90%
Race		
1 Hispanic	208	14.52%
2 Black/Not Hispanic	126	8.79%
3 Other	1099	76.69%
Education		
1 No degree	225	17.79%
2 High school diploma/GED	600	41.87%
3 Bachelor's/Other degree	271	18.91%
4 Master's/Doctorate degree	87	6.07%
5 Under 16 Inapplicable	220	15.35%

Appendix A Univariate/bivariate tables

Table 19 Descriptive statistics of insurance characteristics

	Descriptives (N=1433)	
	Freq	Percentage
Insurance Coverage RD1-3		
1 Private	976	68.11
2 Public	364	25.40
3 Uninsured	93	6.49
Insurance Coverage RD4-5		
1 Private	893	68.27
2 Public	314	24.01
3 Uninsured	101	7.72
24 month period coverage		
1 Coverage 18-24 months	1232	85.97
2 Coverage 12-17 months	65	4.54
3 Coverage 6-11 months	42	2.93
4 Coverage 0-6 months	94	6.56

Appendix A Univariate/bivariate tables

Table 20 ICD9 Diagnostic codes of Panel 1/Panel 3 respondents

ICD-9 diagnosis	Panel 1 N=1067	Panel 3 N=557
No diagnosis	111	38
Non-mental health diagnosis	216	99
Mental health diagnosis	740	420
295 Schizophrenic disorder	19	9
296 Affective disorders	31	25
297 Paranoid states	3	
298 Other non-organic disorders	6	2
300 Neurotic disorders	173	88
301 Personality disorders	-	3
302 Sexual disorders	9	4
308 Acute reactions stress	80	59
309 Adjustment reactions	13	9
311 Depressive disorders	351	193
V40 Mental/behavioral problems	22	8
V61 Other family circumstances	20	3
V62 Other psychosocial circumstances	13	17

Appendix A Univariate/bivariate tables

Table 21 Descriptive statistics of impairment characteristics

	Descriptive (N=1433)	
	Freq	Percentage
Perceived health status		
1 Excellent	228	15.97%
2 Very good	354	24.79%
3 Good	417	29.20%
4 Fair	282	19.75%
5 Poor	147	10.29%
Perceived mental health status		
1 Excellent	178	12.46%
2 Very good	306	21.43%
3 Good	468	32.77%
4 Fair	345	24.16%
5 Poor	131	9.17%
Activity limitations		
1 Yes	332	23.63%
2 No	1073	76.37%
Social limitations		
1 Yes	1226	86.64%
2 No	189	13.36%

Appendix A Univariate/bivariate tables

Table 22 Bivariate analysis of number of visits

Average number of visits among respondents with at least one MH visit (N=1488)	MEAN visits (SD)
Gender	
1 Male	13.06(20.79)
2 Female	13.01(21.58)
Age	
2 5-17	14.44 (20.27
3 18-24	9.07 (12.30)
4 25-44	14.41 (22.27)
5 45-64	13.80 (24.44)
6 65-90	6.23 (9.71)
Race	
1 Hispanic	12.31 (20.09)
2 Black	11.87 (20.37)
3 Other	13.30 (21.59)
Education	
1 No degree	8.82 (12.54)
2 HS/GED	11.82 (18.43)
3 Bachelor's/Oth	16.22 (27.29)
4 Advanced degree	19.09 (33.40)
5 Under 16 Inappl	14.86 (33.40)
Coverage RD1-3	
1 Private	12.05 (20.50)
2 Public	15.51 (23.50)
3 Uninsured	13.61 (19.34)
Coverage RD4-5	
1 Private	12.62 (21.32)
2 Public	17.13 (24.46)
3 Uninsured	11.18 (17.77)
24 mo coverage	
1 18-24 months	13.22 (21.65)
2 12-17 months	12.38 (21.51)
3 6-11 months	10.31 (12.56)
4 0-6 months	12.21 (19.16)
General diagnosis	
1 Mental health	14.55 (22.58)
2 Medical dx only	10.86 (19.32)
3 No diagnosis	5.86 (9.80)
Psychotropic medication[**]	
No	10.60 (20.58)
Yes	15.25 (21.65)
Health status [*]	

1 Excellent	14.45 (26.95)
2 Very good	10.80 (17.84)
3 Good	11.70 (16.75)
4 Fair	16.24 (26.19)
5 Poor	14.24 (19.24)
Mental health **	
1 Excellent	7.52 (17.96)
2 Very good	11.45 (21.92)
3 Good	13.43 (21.12)
4 Fair	15.04 (19.78)
5 Poor	17.92 (26.22)
Activity limitation **	
1 No	11.52 (18.98)
2 Yes	17.80 (26.33)
Social limitations *	
1 No	12.01 (19.50)
2 Yes	19.43 (29.60)
Provider listens	
1 Yes	13.07 (21.50)
2 No	12.40 (16.64)
Provider confidence	
1 Yes	13.11 (21.60)
2 No	11.81 (16.70)
Satisfaction with provider/staff	
1 Very satisfied	13.00 (21.40)
2 Somewhat	12.70 (20.65)
3 Not too satisfied	15.72 (24.65)
4 Not at all satisfied	12.78 (16.24)
Satisfaction with quality of care	
1 Very satisfied	12.80 (21.76)
2 Somewhat	14.14 (20.10)
3 Not too satisfied	13.87 (19.70)
4 Not at all satisfied	5.50 (7.08)

**$p<.01$ *$p<.05$ F statistic used to evaluate differences in means

Appendix A Univariate/bivariate tables

Table 23 Mean number of visits for depression subgroup

Average number of visits among respondents with at least one MH visit (N=1488)	
	MEAN(SD)
Gender	
1 Male	16.82(24.16)
2 Female	16.00(23.70)
Age	
2 5-17	23.21(27.63)
3 18-24	13.25(16.83))
4 25-44	18.65(22.95)
5 45-64	15.66(28.06)
6 65-90	8.08(11.39)
Race	
1 Hispanic	15.09(22.08)
2 Black	13.41(16.18)
3 Other	16.72(24.71)
Education *	
1 No degree	10.39(13.08)
2 HS/GED	15.29(20.88)
3 Bachelor's/Oth	18.47(28.24)
4 Advanced degree	24.03(36.19)
5 Under 16 Inappl	28.90(30.29)
Coverage RD1-3	
1 Private	14.93(23.17)
2 Public	20.24(26.70)
3 Uninsured	14.03(16.31)
Coverage RD4-5	
1 Private	14.93(23.35)
2 Public	21.82(27.38)
3 Uninsured	13.64(17.05)
24 mo coverage	
1 18-24 months	16.78(24.75)
2 12-17 months	13.37(19.83)
3 6-11 months	13.09(17.44)
4 0-6 months	13.32(16.11)
General diagnosis	
1 Mental health	16.24(23.82)
2 Medical dx only	-
3 No diagnosis	-
Psychotropic medication	
No	15.80(31.33)
Yes	16.34(21.85)
Health status *	
1 Excellent	21.64(37.71)

2 Very good	11.90(14.97)
3 Good	14.06(18.03)
4 Fair	20.83(29.33)
5 Poor	15.03(15.84)
Mental health *	
1 Excellent	5.34(5.85)
2 Very good	17.25(32.51)
3 Good	15.57(20.37)
4 Fair	17.16(21.47)
5 Poor	19.66(27.03)
Activity limitation	
1 No	14.53(21.41)
2 Yes	20.70(28.57)
Social limitations *	
1 No	14.66(21.89)
2 Yes	23.60(29.90)
Provider listens	
1 Yes	16.15(23.90)
2 No	18.27(22.27)
Provider confidence	
1 Yes	16.22(23.98)
2 No	16.67(20.78)
Satisfaction with provider/staff	
1 Very satisfied	16.02(24.13)
2 Somewhat	15.02(19.25)
3 Not too satisfied	24.4(35.05)
4 Not at all satisfied	21.8(27.54)
Satisfaction with quality of care	
1 Very satisfied	16.04(24.42)
2 Somewhat	16.42(20.95)
3 Not too satisfied	21.68(28.03)
4 Not at all satisfied	4(1.22)

**p<.01 *p<.05 F statistic used to evaluate differences in means

Appendix B

Table 24 Partial correlation coefficients showing the unique variance contributed to each model

	Model 1	Model 2	Model 3
	More than one visit	More than two visits	More than three visits
Sex	.0684 **	.0640 *	.0516 *
Education	.0146 *	.0467 *	.0453 *
Health	.0518 *	.04 *	.0621 *
Mental			.0460 *
Activity limitations	.0814 **	.0762 **	.0446 *
Psychotropic drugs	.05 *	.0544 **	.0436 *
Confidence in provider	.0386 *		
Satisfaction with quality	-.0570 **		
Visit weights			

*p<.05 **p<.01

Appendix B Multivariate tables

Table 25 Main effects model with analytic weights of the relationship between satisfaction with care and the probability of more than one visit

		F statistic (36,220)	
		OR (SE)	95% CI
Sex	*Male*		
	Female	1.58(.34)	1.0-2.4
Race	*White*		
	Hispanic	1.0(.28)	.58-1.7
	Black	.47(.16)*	.24-.91
Age	*25-44*		
	18-24	.89(.37)	.4-2.0
	45-64	1.26(.25)	.84-1.9
	65-90	1.11(.31)	.63-1.9
Education	*No degree*		
	High school/GED	1.15(.31)	.68-1.96
	Bachelor's/other degree	1.82(.68)	.87-3.8
	Master's/Doctorate	2.0(1.03)**	.71-5.5
Insurance	*Private*		
	Public	.95(.21)	.62-1.5
	Uninsured	.23(.17)*	.05-1.0
Health	*Excellent*		
	Very good	.83(.29)	.42-1.6
	Good	1.2(.40)	.61-2.3
	Fair	1.7(.60)	.83-3.4
	Poor	2.4(1.0)*	1.04-5.4
Mental health	*Excellent*		
	Very good	1.42(.42)	.8-2.5
	Good	2.16(.61)**	1.2-3.8
	Fair	1.8(.64)	.87-3.6
	Poor	1.34(.57)	.59-3.1
Activity limits	*No*		
	Yes	1.94(.47)**	1.2-3.1
Social limits	*No*		
	Yes	1.28(.39)	.71-2.32
Psychotropic	*No*		
	Yes	1.37(.27)	.93-2.0
Appt difficulty	*Very difficult*		
	No difficulty	.83(.17)	.56-1.2
Phone difficulty	*Very difficult*		
	No difficulty	.88(.18)	.6-1.3
Provider listens	*No*		
	Yes	.59(.26)	.25-1.4
Confident in	*No*		

Provider	Yes	2.8(1.3)*	1.1-7.2
Satisfaction with provider/staff	*Not satisfied* Satisfied	2.0(.92)	.82-4.95
Satisfaction w quality of care	*Not satisfied* Satisfied	.32(.21)	.085-1.18

Probability of obtaining an *F* statistic at least as large at random: *p<.05 **p<.01

Appendix B Multivariate tables

Table 26 Stratified multivariate models of satisfaction with quality of care on probability of a subsequent visit

	Satisfaction with quality of care		
	More than 1 visit	More than 2 visits	More than 3 visits
	Ref=Not satisfied(0)	Ref=Not satisfied(0)	Ref=Not satisfied(0)
	Satisfied(1)	Satisfied(1)	Satisfied(1)
	OR(SE)	OR(SE)	OR(SE)
Main effects LR models	**0.23(.14)***	.51(.24)	.82(.36)
Stratified by sex			
Male	.21(.21)	.23(.19)	**.19(.16)***
Female	**.11(.11)***	.86(.58)	2.6(1.7)
Stratified by race			
Hispanic	.09(.14)	2.43(3.41)	19.38(30.45)
Black	.29(1.09)	.25(.49)	.07(.14)
Other	**.14(.11)***	**.29(.18)***	.48(.27)
Stratified by psdrug			
Yes	.51(.53)	.27(.24)	.94(.73)
No	**.09(.08)***	.69(.44)	.85(.53)
Stratified by diagnosis			
Mental health	.27(.22)	.61(.38)	1.22(.70)
Medical only/ none	.15(.16)	.34(.29)	.40(.33)
Stratified by health			
Excellent/very good	.13(.18)	.35(.34)	.60(.56)
Good/fair/poor	.26(.19)	.84(.48)	1.06(.58)
Stratified by agecat			
0-17/18-24	.53(.84)	.38(.50)	.68(.78)
25-44	.47(.39)	1.56(.103)	1.75(1.14)
45-64			
45-64/65-90	**.007(.01)****	**.05(.06)***	.23(.23)
Stratified by education			
Less than high school	.62(.82)	1.09(1.18)	3.13(3.2)
High school/GED	**.08(.11)***	.54(.40)	.82(.55)
College	.29(.40)	.52(.62)	.31(.36)
Stratified by coverage			
Private	**.25(.18)***	**.21(.14)***	**.26(.16)***
Public/Uninsured	.22(.26)	2.35(1.8)	**5.17(4.13)***
Stratified by mental			
Excellent/very good	**.06(.08)***	.60(.53)	1.8(1.5)
Good/fair/poor	.32(.22)	.52(.29)	.60(.32)

** p<.01 * p<.05

Appendix B Appendix B Multivariate tables

Table 27 Stratified multivariate models of the relationship between satisfaction with provider/staff and the probability of a subsequent visit

	Satisfaction with provider/staff		
	More than 1 visit	More than 2 visits	More than 3 visits
	Ref=Not satisfied(0)	Ref=Not satisfied(0)	Ref=Not satisfied(0)
	Satisfied(1)	**Satisfied(1)**	**Satisfied(1)**
	OR(SE)	**OR(SE)**	**OR(SE)**
Main effects LR models	2.09(.79)	1.57(.54)	1.01(34)
Stratified by sex			
Male	2.75(1.9)	2.2(1.4)	1.65(1.04)
Female	2.28(1.3)	1.45(.74)	1.03(.52)
Stratified by race			
Hispanic	3.14(.322)	1.02(.92)	.46(.45)
Black	.17(.53)	.56(.93)	.60(1.03)
Other	2.26(.97)	1.83(.73)	1.32(.51)
Stratified by psdrug			
Yes	1.87(1.18)	2.48(1.37)	1.33(.72)
No	**3.4(2.04)***	.94(.52)	.70(.37)
Stratified by diagnosis			
Mental health	**4.02(2.04)****	**2.9(1.3)***	1.71(.76)
Medical only/ none	.82(.58)	.45(.30)	**.26(.18)***
Stratified by health			
Excellent/very good	2.2(1.4)	**3.53(.23)***	3.54(2.42)
Good/fair/poor	1.7(.81)	.91(.39)	.54(.23)
Stratified by agecat			
0-17/18-24	.91(.68)	1.56(1.08)	.65(.42)
25-44	2.18(1.29)	.54(.31)	.46(.26)
45-64/65-90	**7.53(70.8)***	**6.35(5.1)***	1.93(1.30)
Stratified by education			
Less than high school	.52(.52)	.71(.65)	.19(.17)
High school/GED	2.09(1.21)	1.88(.97)	1.55(.78)
College	2.88(.323)	.98(1.04)	1.38(1.35)
Stratified by coverage			
Private	1.8(.82)	0.269	1.16(.50)
Public/Uninsured	3.3(2.3)	1.75(1.04)	.86(.52)
Stratified by mental			
Excellent/very good	.88(.66)	.78(.55)	.91(.66)
Good/fair/poor	**2.83(1.23)***	1.76(.68)	1.04(.40)

**p<.01 *p<.05

Appendix B Multivariate tables

Table 28 Stratified multivariate models of the relationship between provider listens and the probability of a subsequent visit

	Provider listens		
	More than 1 visit	More than 2 visits	More than 3 visits
	Ref=does not listen(0)	Ref=does not listen(0)	Ref=does not listen(0)
	Provider listens(1) OR(SE)	**Provider listens(1) OR(SE)**	**Provider listens(1) OR(SE)**
Main effects models	.85(.40)	1.0(.40)	1.05(.40)
Stratified by sex			
Male	.72(.65)	1.79(1.24)	2.19(1.5)
Female	1.26(.81)	.80(.44)	.58(.31)
By race			
Hispanic	.57(.89)	.26(.42)	.08(.13)
Black	1.3(2.09)	.14(.19)	.69(1.0)
Other	1.41(.83)	1.69(.81)	1.4(.63)
By psychotropic			
Yes	.79(.60)	1.37(.82)	.98(.56)
No	.78(.52)	1.07(.66)	1.13(.69)
By diagnosis			
Mental health	.50(.34)	1.01(.55)	1.05(.49)
Medical only/ none	1.91(1.6)	1.35(1.01)	2.03(1.6)
By health			
Excellent/very good	.20(.20)	.53(.40)	.64(.46)
Good/fair/poor	1.68(.97)	1.31(.64)	1.23(.57)
By age category			
0-17/18-24	.83(1.06)	.64(.76)	.72(.77)
25-44	1.23(.83)	.95(.57)	.82(.49)
45-64/65-90	.78(.79)	1.42(1.12)	2.2(1.54)
By education			
Less than HS	1.32(.154)	.82(.84)	1.54(1.41)
High school/GED	.56(.42)	.92(.51)	1.7(.60)
College	.42(.58)	1.1(1.24)	.57(.63)
By coverage			
Private	.50(.31)	1.14(.58)	1.64(.79)
Public/Uninsured	3.06(2.5)	1.33(.92)	.93(.65)
Stratified by mental			
Excellent/very good	.54(.45)	.87(.60)	1.08(.73)
Good/fair/poor	1.18(.73)	.94(.47)	1.02(.47)

$**p<.01$ $*p<.05$

Appendix B Multivariate tables

Table 29 Stratified multivariate analysis of the relationship between confidence in provider and the probability of a subsequent visit

	Confidence in provider		
	More than 1 visit	More than 2 visits	More than 3 visits
	Ref=Not confident(0)	Ref=Not confident(0)	Ref=Not confident(0)
	Confident (1)	**Confident (1)**	**Confident (1)**
	OR(SE)	**OR(SE)**	**OR(SE)**
Main effects LR models	2.16(.89)	1.35(.49)	1.16(.41)
Stratified by sex			
Male	1.21(1.0)	1.05(.65)	1.04(.62)
Female	**4.16(2.5)***	1.53(.82)	1.34(.70)
Stratified by race			
Hispanic	4.89(5.72)	.65(.71)	.96(1.03)
Black	.84(2.2)	8.94(14.9)	1.25(2.23)
Other	2.14(1.06)	1.51(.63)	1.40(.57)
Stratified by psdrug			
Yes	1.93(1.43)	1.5(.93)	1.24(.72)
No	2.28(1.33)	1.47(.80)	1.17(.63)
Stratified by diagnosis			
Mental health	2.93(1.65)	1.32(.64)	1.23(.57)
Medical only/ none	1.11(.79)	1.21(.78)	1.03(.68)
Stratified by health			
Excellent/very good	1.94(1.21)	2.23(1.31)	2.02(1.78)
Good/fair/poor	2.81(1.58)	1.05(.52)	.95(.46)
Stratified by agecat			
0-17/18-24	1.27(1.24)	2.93(2.9)	1.78(1.68)
25-44	1.71(1.08)	1.39(.71)	1.48(.73)
45-64/65-90	**11.98(12.3)***	1.78(1.56)	1.0(.81)
Stratified by education			
Less than high school	**10.6(12.4)***	5.34(5.25)	2.83(2.2)
High school/GED	1.41(.97)	.34(.21)	.412(.23)
College	**25.4(27.6)****	**7.9(6.2)****	**7.8(5.5)****
Stratified by coverage			
Private	**3.07(1.5)***	2.27(1.03)	1.98(.86)
Public/Uninsured	.72(.63)	.35(.26)	.30(.22)
Stratified by mental			
Excellent/very good	**4.27(2.9)***	1.25(.80)	.83(.52)
Good/fair/poor	1.55(.86)	1.48(.68)	1.43(.64)

**p<.01 *p<.05

Appendix B Multivariate tables

Table 30 Stratified multivariate analysis of the relationship between phone difficulty and the probability of a subsequent visit

	Difficulty contacting provider by phone		
	More than 1 visit	More than 2 visits	More than 3 visits
	Ref=Difficult (0)	Ref=Difficult (0)	Ref=Difficult (0)
	Not difficult (1) OR(SE)	Not difficult (1) OR(SE)	Not difficult (1) OR(SE)
Main effects LR models	.89(.06)	.96(.16)	1.122(.18)
Stratified by sex			
Male	.60(.22)	.74(.24)	.92(.29)
Female	1.05(.25)	1.12(.24)	1.15(.24)
Stratified by race			
Hispanic	.97(1.7)	3.38(1.7)*	2.43(1.14)
Black	2.0(1.72)	.61(.45)	.70(.53)
Other	.77(.17)	.86(.16)	1.51(.21)
Stratified by psdrug			
Yes	.99(.29)	.90(.22)	.99(.23)
No	.90(.26)	1.22(.33)	1.3(.34)
Stratified by diagnosis			
Mental health	.80(.19)	.88(.18)	1.0(.19)
Medical only/ none	1.38(.50)	1.78(.60)	1.9(.66)
Stratified by health			
Excellent/very good	.94(.25)	.92(.24)	1.24(.32)
Good/fair/poor	.82(.21)	.97(.21)	1.06(.22)
Stratified by agecat			
0-17/18-24	1.40(.58)	1.25(.49)	1.99(.74)
25-44	1.2(.36)	1.12(.29)	.86(.22)
45-64/65-90	.56(.19)	.74(.21)	1.19(.32)
Stratified by education			
Less than high school	1.3(.68)	1.51(.67)	2.08(.90)
High school/GED	.94(.26)	1.13(.28)	1.23(.30)
College	.71(.33)	.76(.29)	.82(.28)
Stratified by coverage			
Private	.90(.20)	1.13(.23)	1.22(.23)
Public/Uninsured	.92(.33)	.72(.21)	.99(.30)
Stratified by mental			
Excellent/very good	.93(.27)	1.25(.35)	1.53(.44)
Good/fair/poor	.89(.21)	.93(.19)	1.03(.20)

**p<.01 *p<.05

Appendix B Multivariate tables

Table 31 Stratified multivariate analysis of the relationship between appointment difficulty and the probability of a subsequent visit

	Difficulty getting appointment with provider		
	More than 1 visit	More than 2 visits	More than 3 visits
	Ref=Difficult(0)	Ref=Difficult(0)	Ref=Difficult(0)
	Not difficult (1) OR(SE)	**Not difficult (1) OR(SE)**	**Not difficult (1) OR(SE)**
Main effects LR models	.97(.18)	.94(.15)	1.04(.17)
Stratified by sex			
Male	.92(.33)	.82(.25)	1.14.35)
Female	1.10(.27)	1.04(.23)	1.21(.25)
Stratified by race			
Hispanic	.36(.21)	**.34(.17)***	.59(.27)
Black	**.12(.13)**	.34(.29)	.89(.73)
Other	1.06(.23)	.98(.19)	1.04(.19)
Stratified by psdrug			
Yes	.94(.26)	.94(.23)	1.11(.26)
No	1.06(.30)	.94(.25)	1.19(.32)
Stratified by diagnosis			
Mental health	.97(.23)	.86(.18)	1.07(.21)
Medical only/ none	1.15(.43)	.93(.32)	.94(.34)
Stratified by health			
Excellent/very good	.83(.23)	**.57(.16)***	.82(.22)
Good/fair/poor	.96(.24)	1.17(.25)	1.13(.23)
Stratified by agecat			
0-17/18-24	.44(.22)	.52(.23)	.48(.20)
25-44	.73(.23)	.95(.25)	1.38(.36)
45-64/65-90	1.56(.49)	1.2(.33)	1.15(.30)
Stratified by education			
Less than high school	.53(.28)	.48(.21)	.83(.36)
High school/GED	1.26(.35)	1.5(.37)	1.41(.35)
College	.67(.30)	**.40(.15)***	.73(.24)
Stratified by coverage			
Private	.92(.20)	.77(.16)	.84(.16)
Public/Uninsured	.87(.31)	1.24(.36)	1.7(.50)
Stratified by mental			
Excellent/very good	1.09(.32)	.85(.24)	1.19(.34)
Good/fair/poor	.78(.19)	.87(.18)	.90(.18)

**p<.01 * p<.05

Appendix B Multivariate tables

Table 32 Stratified multivariate analysis of the relationship between satisfaction with care and the probability of depression treatment compliance

	Quality of care Ref=Not satisfied (0) Satisfied(1) OR	Provider/staff Ref=Not satisfied (0) Satisfied(1) OR	Provider listens Ref=does not listen (0) Provider listens (1) OR	Confid in provider Ref=Not confident (0) Confident (1) OR	Phone difficulty Ref=Difficult (0) Not difficult (1) OR	Appt difficulty Ref=Difficult (0) Not difficult (1) OR
Main effects	.97(.63)	1.2(.51)	.66(.32)	.85(.42)	.78(.15)	1.37(.47)
By sex						
Male	2.44(3.25)	.33(.41)	2.4(2.5)	.02(.03)**	.61(.26)	3.4(1.5)**
Female	1.98(1.56)	1.2(.60)	.73(.41)	.38(.24)	.75(.16)	1.06(.24)
By race						
Hispanic						
Black				.24(.25)	.68(.33)	.90(.44)
Other	1.42(1.02)	2.3(1.3)	1.83(.98)	.27(.18)*	.72(.16)	1.03(.23)
By psdrug						
Yes	2.31(2.01)	.87(.47)	1.21(.69)	.08(.07)**	.73(.15)	1.14(.24)
No		27(35)*	9.2(13.8)	.04(.08)	.50(.29)	2.8(2.0)
By health						
Exc/very good	.33(.46)	3.2(3.0)	1.7(1.6)	.99(.92)	.87(.28)	.68(.24)
Good/fair/poor	1.45(1.31)	1.1(.6)	.58(.39)	.26(.19)	.54(.14)*	1.9(.5)*
By agecat						
0-17/18-24						
25-44	1.55(1.64)	1.2(.80)	1.8(1.1)	.11(.11)*	.79(.24)	.77(.24)
45-64/65-90	10.4(13.3)	1.4(1.3)	.53(.55)	.09(.10)	.78(.23)	1.64(.49)
By education						
Less than HS						
HS/GED	5.94(5.32)*	1.9(1.2)	1.22(.76)	.07(.06)**	.73(.21)	1.28(.38)
College	.44(.56)	.60(.63)	5.4(7.4)	.24(.33)	.56(.21)	.91(.35)
By coverage						
Private	2.2(1.55)	1.9(1.0)	1.02(.62)	.18(.11)**	.98(.22)	.76(.18)
Public/Uninsr	1.91(3.6)	.06(.08)*	.75(.65)	1.5(2.7)	.38(.15)*	8.3(3.7)**
By mental						
Exc/very good	2.73(4.39)	2.9(3.1)	1.06(1.12)	.48(.43)	1.42(.50)	1.04(.37)
Good/fair/poor	1.94(1.34)	.89(.48)	.66(.38)	.25(.17)*	.57(.13)*	1.45(.34)

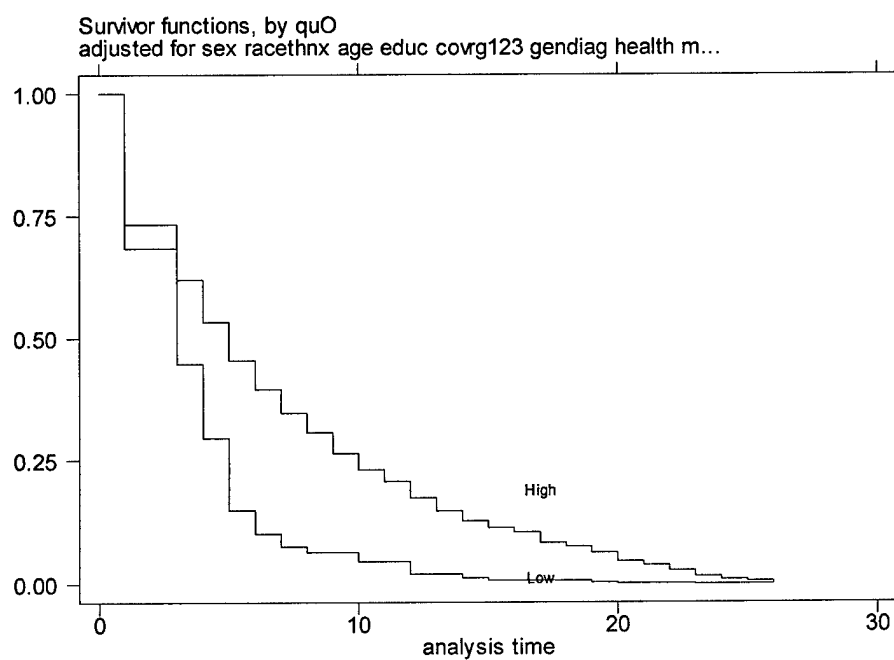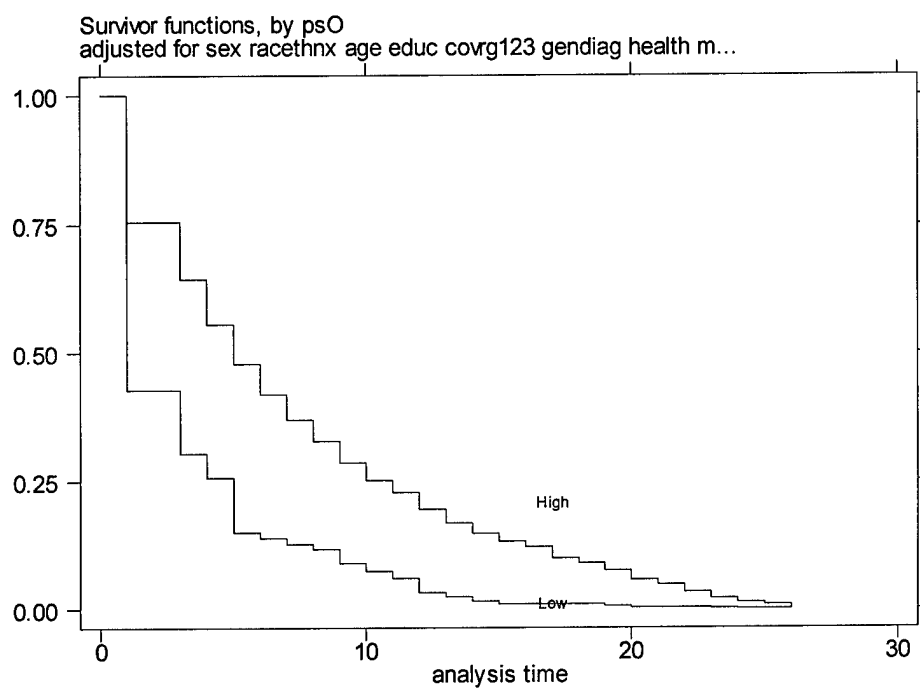**p<.01 *p<.05

Appendix B Multivariate tables

Table 33 Main effects model using analytic weights - Relationship between satisfaction with care and the probability of depression treatment compliance

		Survey logit F statistic (df=18)		
		OR (SE)	Coefficient	95% CI
Race	*White*			
	Black	.42(.24)	-.87	.14-1.28
Age	*25-44*			
	0-17	.50(.31)	-.70	.15-1.71
	18-24	1.01(.52)	.01	.37-2.81
	45-64	1.02(.36)	.02	.51-2.03
	65-90	.56(.25)	-.58	.23-1.35
Health	*Excellent*			
	Very good	1.65(.65)	.50	.75-3.6
	Good	2.39(1.28)	.87	.83-6.88
	Fair	3.12(1.71)*	1.14	1.05-9.22
	Poor	4.81(2.61)**	1.57	1.65-14.04
Activity limitations	*No*			
	Yes	1.67(.60)	.51	.82-3.4
Appt difficulty	*Very difficult*			
	No difficulty	1.31(.47)	.27	.65-2.65
Phone difficulty	*Very difficult*			
	No difficulty	.85(.25)	-.16	.48-1.51
Provider listens	*No*			
	Yes	1.73(1.10)	.55	.49-6.06
Confident in provid	*No*			
	Yes	.08(.10)*	-2.53	.007-.90
Satisfaction with provider/staff	*Not satisfied*			
	Satisfied	1.52 (.78)	.42	.55-4.20
Satisfaction w quality of care	*Not satisfied*			
	Satisfied	4.37(5.37)	1.47	.39-49.54

F(18, 144)=5.19

Probability of obtaining a F statistic at least as large at random: *p<.05 **p<.01

Appendix C

Figure 2 Adjusted survival curves: high/ low satisfaction with quality of care

Survivor functions, by quO
adjusted for sex racethnx age educ covrg123 gendiag health m...

Figure 3 Adjusted survival curves: high/ low satisfaction with provider/staff

Survivor functions, by psO
adjusted for sex racethnx age educ covrg123 gendiag health m...

Appendix C Survival analysis figures and tables

Figure 4 Adjusted survival curves: has confidence (high) / does not have confidence (low)

Survivor functions, by coO
adjusted for sex racethnx age educ covrg123 gendiag health m...
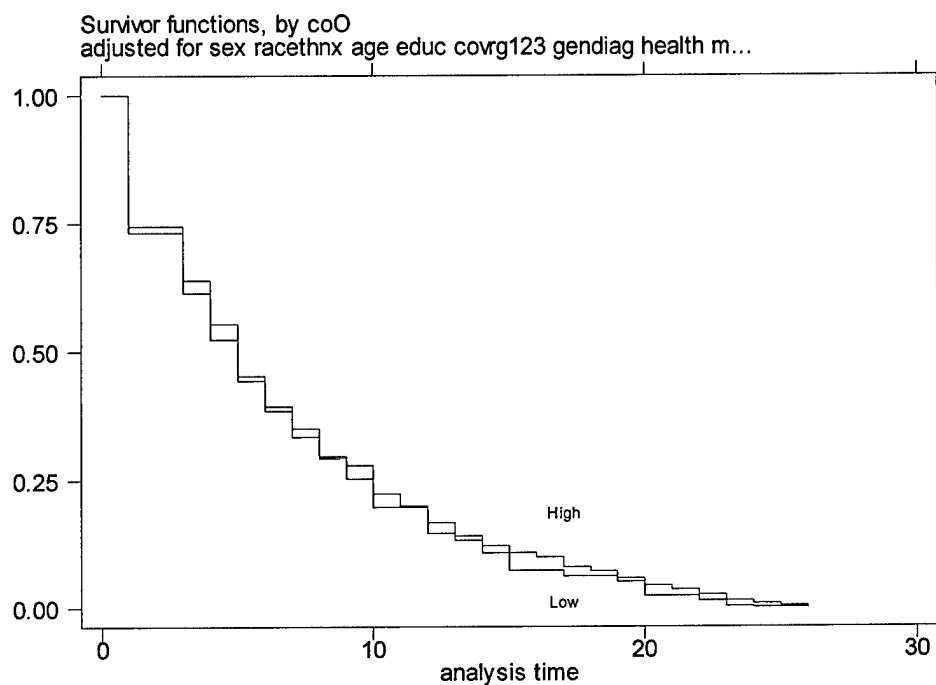
Figure 5 Adjusted survival curves: provider listens (high) / provider does not listen (low)

Survivor functions, by liO
adjusted for sex racethnx age educ covrg123 gendiag health m...
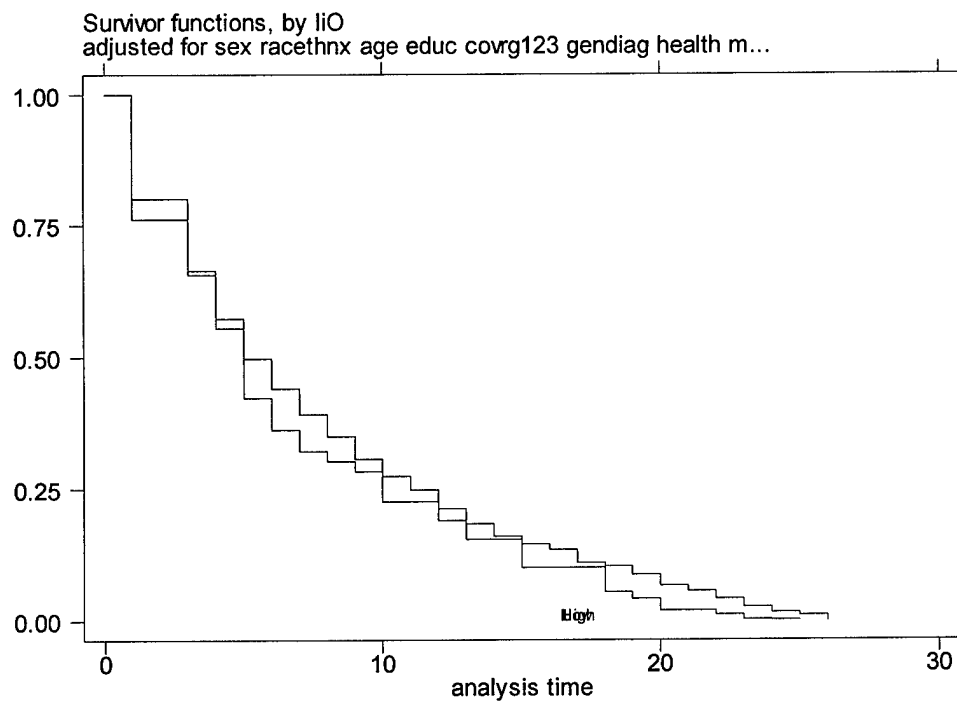
Appendix C Survival analysis figures and tables

Table 34 Stratified Weibull hazard models comparing satisfaction and time-to-failure rates

	Quality of care	Provider and staff	Provider listens	Confidence in provider
	Ref=Not satisfied	Ref=Not satisfied	Ref=does not listen	Ref=Not confident
	Satisfied(1)	Satisfied(1)	Provider listens (1)	Confident.in provider(1)
	HR(SE)	HR(SE)	HR(SE)	HR(SE)
Main effects model	1.29(.26)	1.10(.15)	1.15(.18)	.76(.12)
Stratified by sex				
Male	1.38(.40)	1.24(.26)	1.11(.27)	.78(.19)
Female	1.13(.36)	.77(.15)	1.16(.27)	.78(.18)
Stratified by race				
Hispanic	.64(.33)	1.61(.60)	1.5(.90)	.82(.40)
Black	1.03(.72)	1.17(.63)	**.39(.18)***	1.9(1.22)
Other	1.42(.35)	1.12(.18)	1.25(.23)	**.66(.12)***
By psychotropic				
Yes	1.2(41)	.83(.19)	1.39(.33)	.87(.22)
No	1.4(.37)	1.43(.27)	.94(.22)	.75(.17)
By coverage				
Private	1.42(.37)	1.2(.20)	1.7(.23)	.70(.14)
Public	.99(.49)	.70(.24)	.90(.31)	1.4(.61)
Uninsured	3.6(3.11)	.43(.28)	1.67(1.99)	1.69(1.3)
By diagnosis				
Mental health	1.09(.29)	.85(.15)	1.3(.26)	.84(.18)
Medical only	2.5(1.2)	1.6(.50)	.45(.22)	.98(.38)
No diagnosis	2.36(1.6)	2.57(1.5)	1.01(.54)	.34(.20)
By health				
(1-2)	1.09(.40)	.90(.22)	**1.72(.45)***	**.60(.15)***
(3-5)	1.58(.41)	1.21(.21)	.91(.19)	.78(.17)
By mental health				
(1-2)	1.19(.46)	**1.81(.55)***	1.54(.43)	**.49(.14)***
(3-5)	1.45(.35)	.98(.16)	.98(.20)	.83(.17)
By age category				
18-24	2.9(2.6)	.57(.30)	.43(.51)	1.59(1.5)
25-44	.81(.24)	1.18(.29)	1.08(.27)	.73(.16)
45-64	**8.99(4.5)****	**.41(.18)***	.69(.25)	**.41(.15)***
65-90	1.35(1.29)	2.5(1.43)	1.35(.98)	.63(.64)
By education				
Less than HS	1.28(.48)	.98(.32)	.83(.27)	.76(.26)
High School/GED	1.5(.51)	1.2(.28)	1.14(.27)	.71(.19)
Bachelors	2.35(2.04)	.84(.40)	.52(.39)	.68(.28)
Advanced degree	**63.7(79.6)****	**.03(.04)***	**.0006(.001)****	**.03(.02)****

**p<.01 *p<.05

Appendix C Survival analysis figures and tables

Figure 6 Satisfaction with quality of care (Age= 45-64) (High=1 Low=0) p<.01
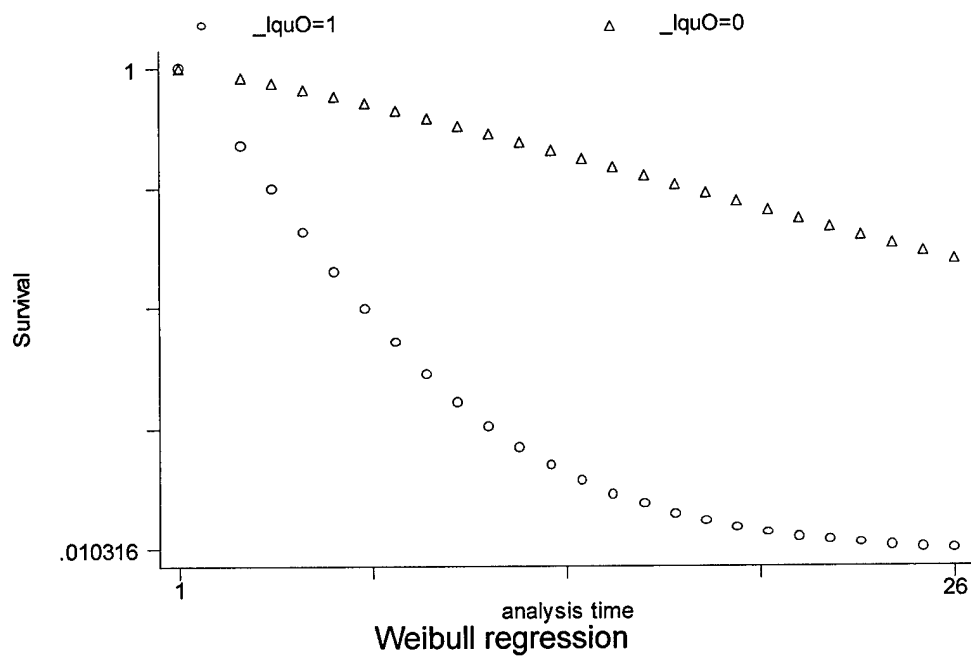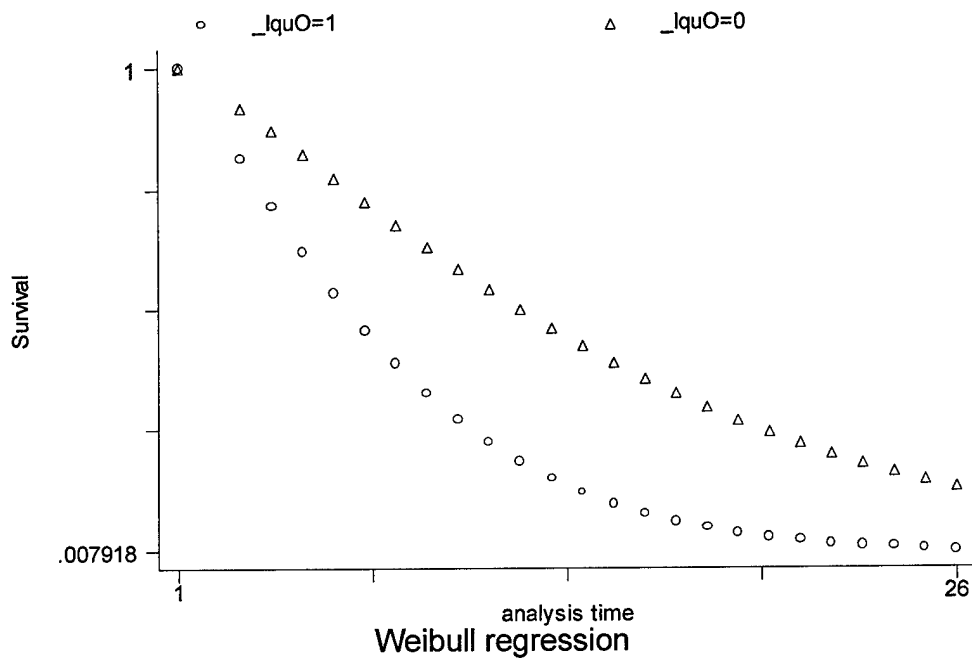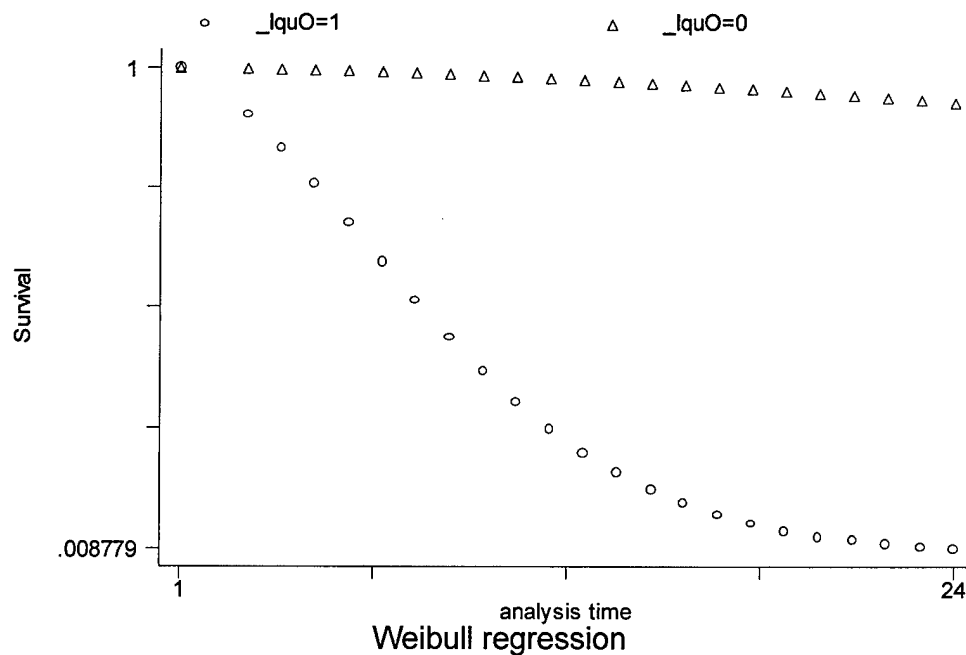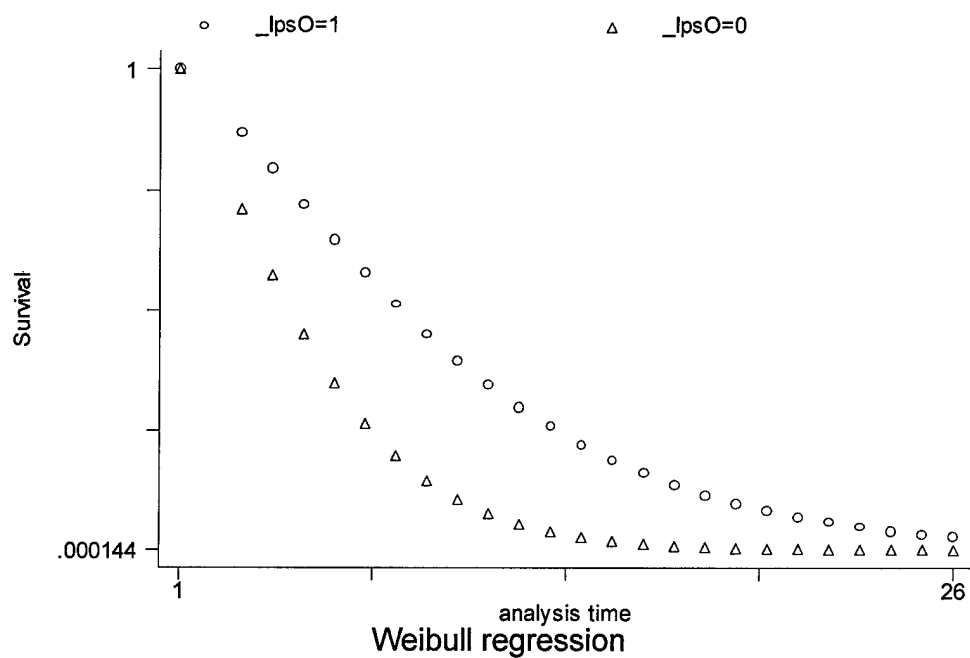

Figure 7 Satisfaction with quality of care (Diagnosis=medical only) (High=1 Low=0) p<.05

Appendix C Survival analysis figures and tables

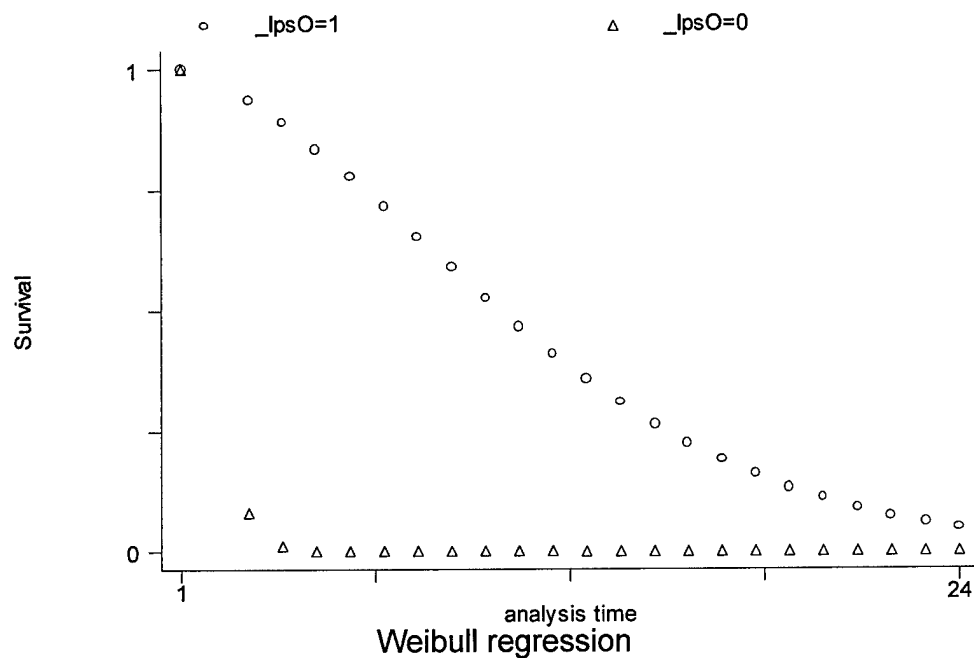**Figure 8 Satisfaction with quality of care (Education=advanced degree) (High=1 Low=0) p<.01**

Weibull regression

Figure 9 Satisfaction with provider/staff (Age=45-64) (High=1 Low=0) p<.05

Weibull regression

Appendix C Survival analysis figures and tables

Figure 10 Satisfaction with provider/staff (Education=advanced degree) (High=1 Low=0) p<.05

Figure 11 Satisfaction with provider/staff (Mental health=excellent/very good) p<.05
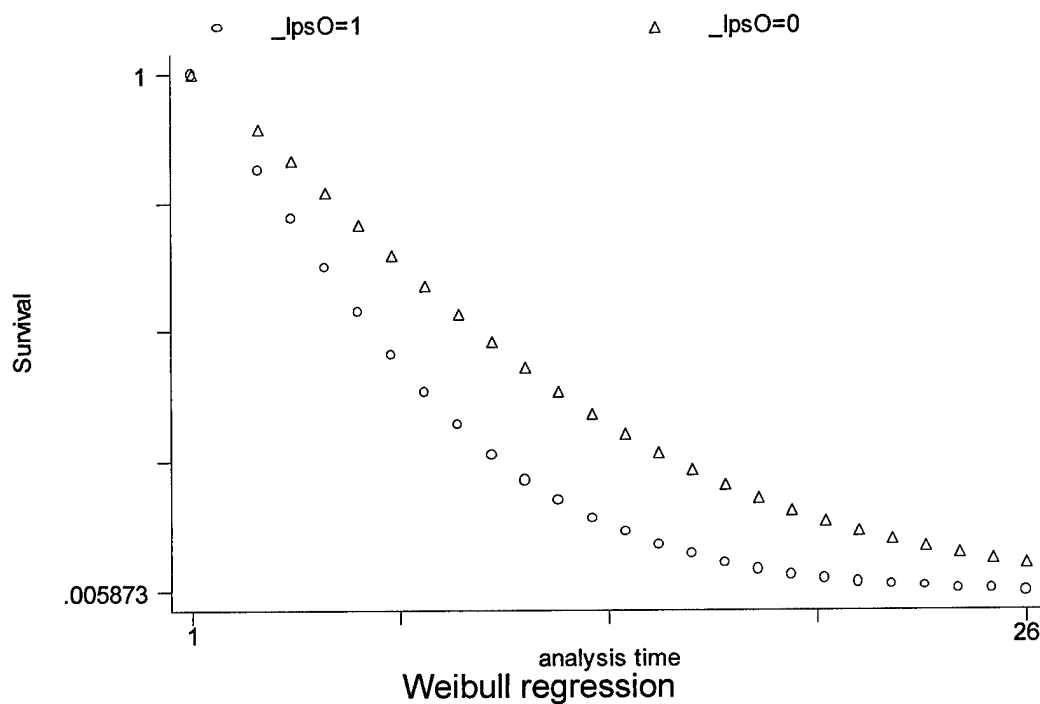
Appendix C Survival analysis figures and tables

Figure 12 Confidence in provider (Health=excellent/very good) (Yes=1 No=0) p<.05

Weibull regression
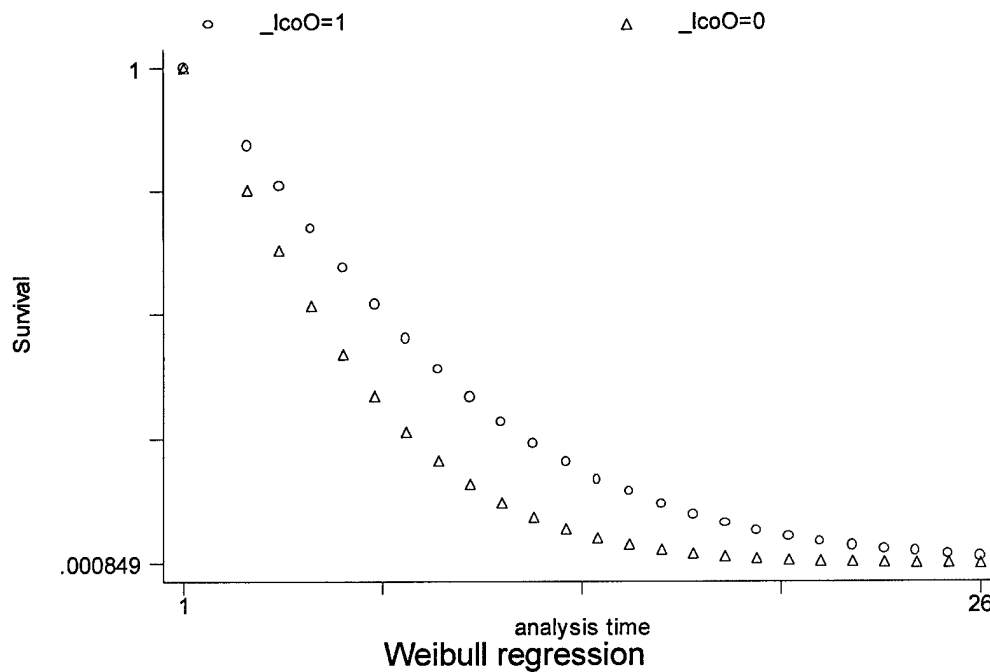
Figure 13 Confidence in provider (Mental health=excellent/very good) (Yes=1 No=0) p<. 05

Weibull regression
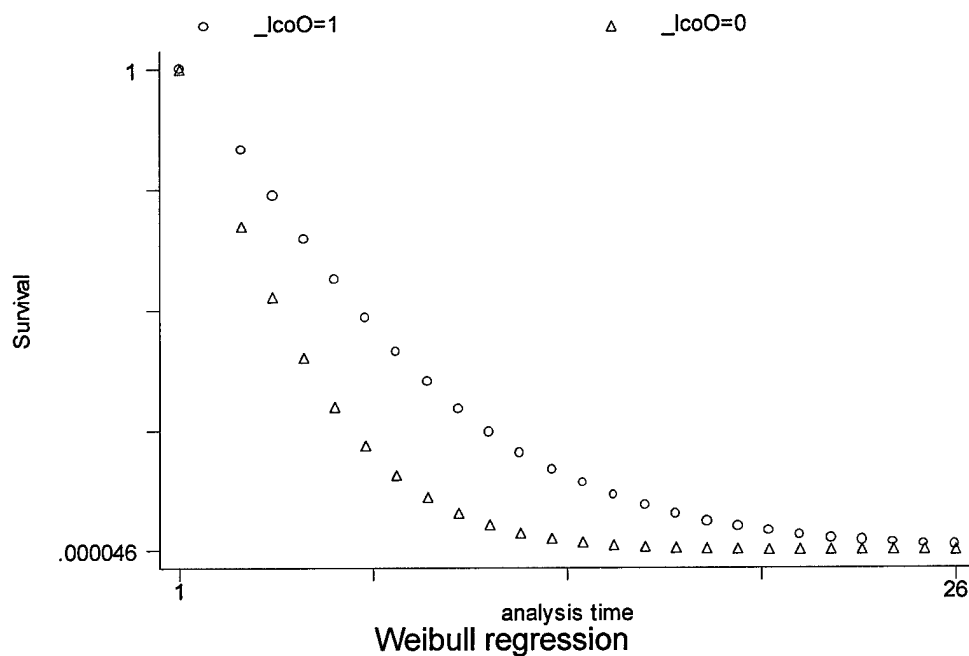
Appendix C Survival analysis figures and tables

Figure 14 Confidence in provider (Age= 45-64) (Yes=1 No=0) p<.05

Weibull regression
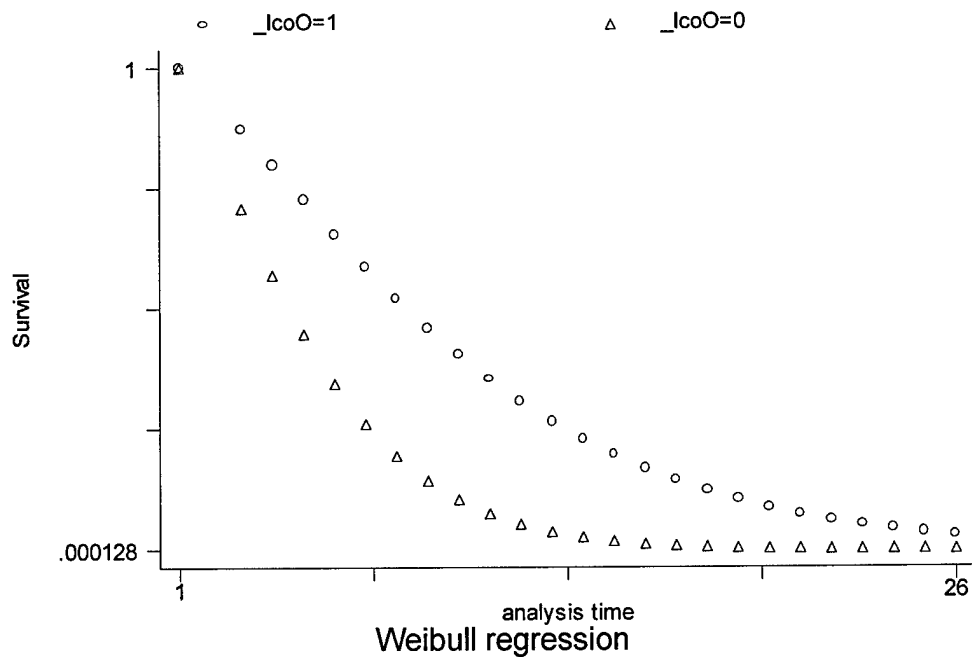
Figure 15 Confidence in provider (Education=advanced degree) (Yes=1 No=0) p<.01

Weibull regression
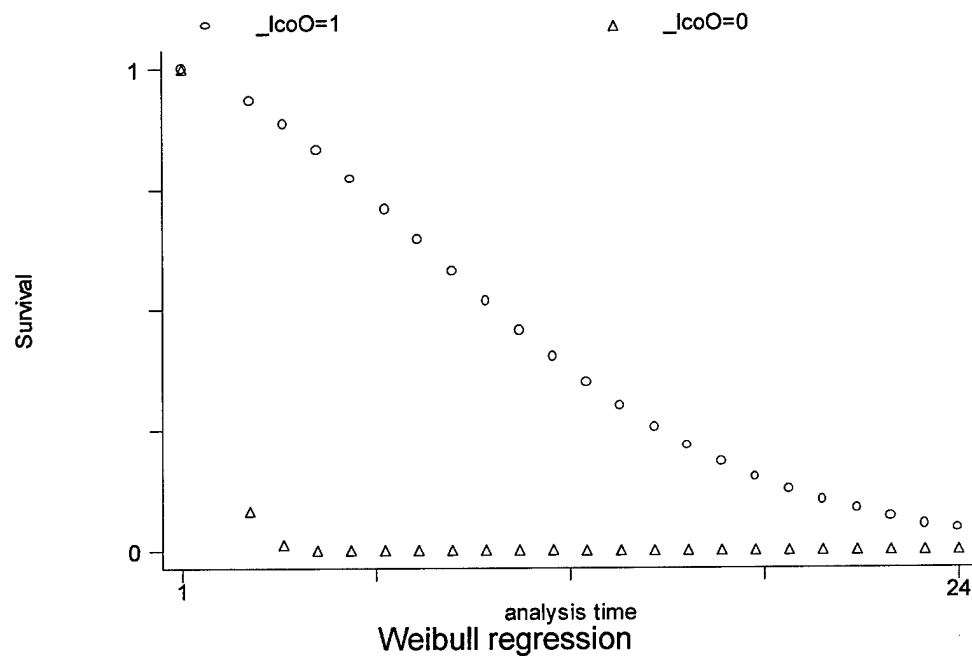
Appendix C Survival analysis figures and tables

Figure 16 Confidence in provider (Race= White) (Yes=1 No=0) p<.05

Weibull regression
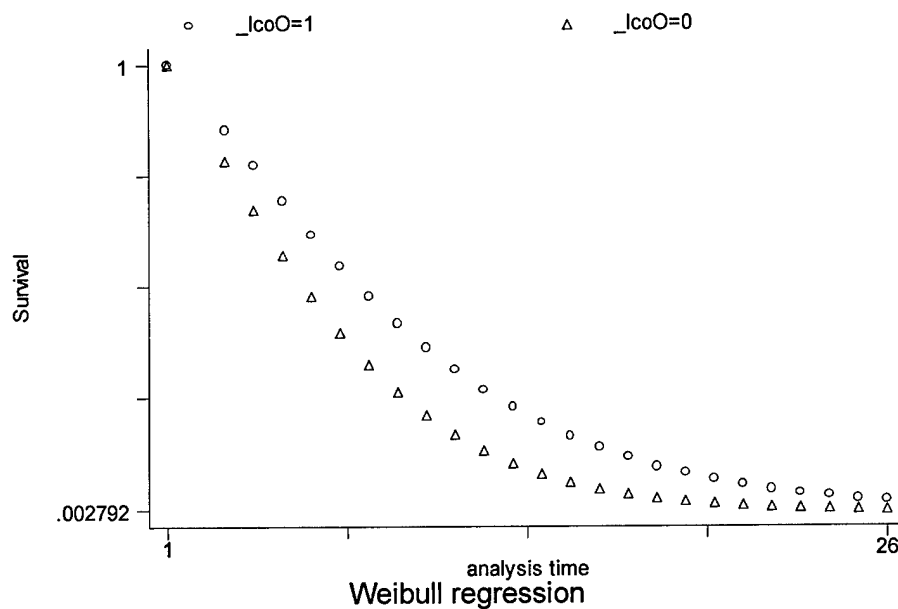
Figure 17 Confidence in provider (Diagnosis=none) (Yes=1 No=0) p=.068

Weibull regression
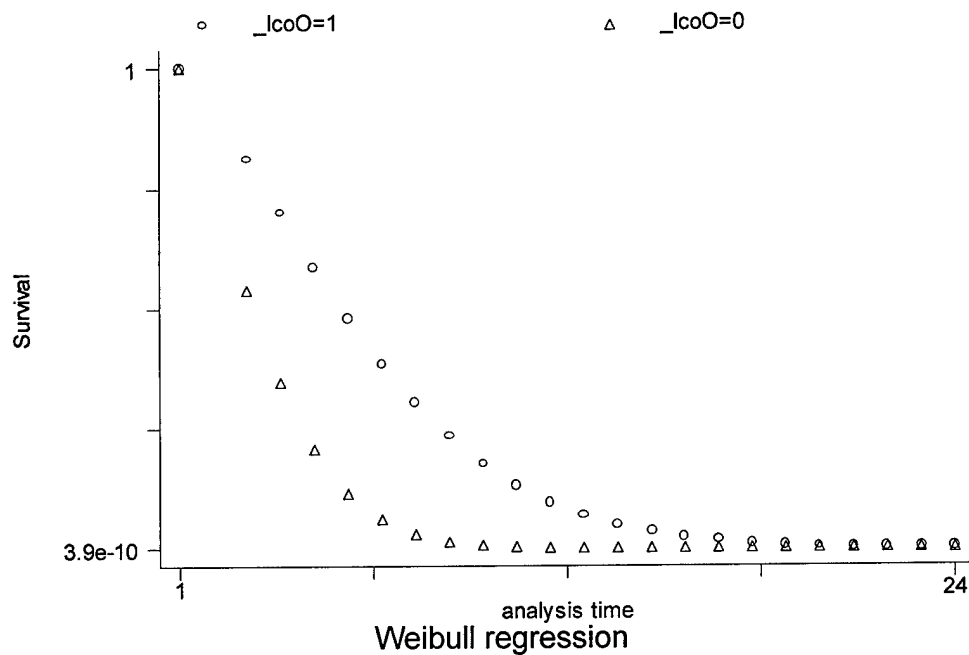
Appendix C Survival analysis figures and tables

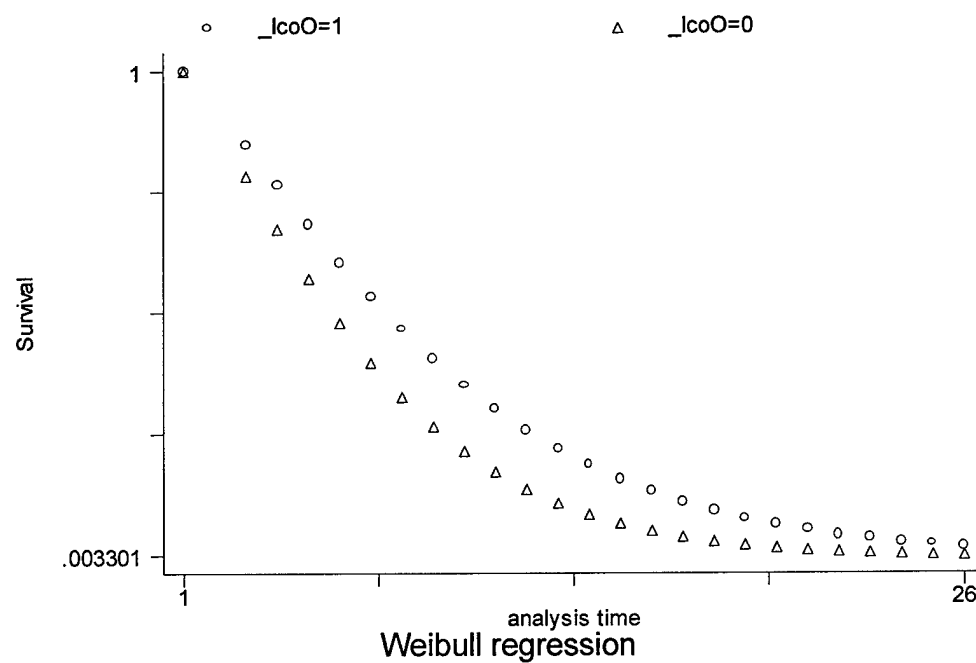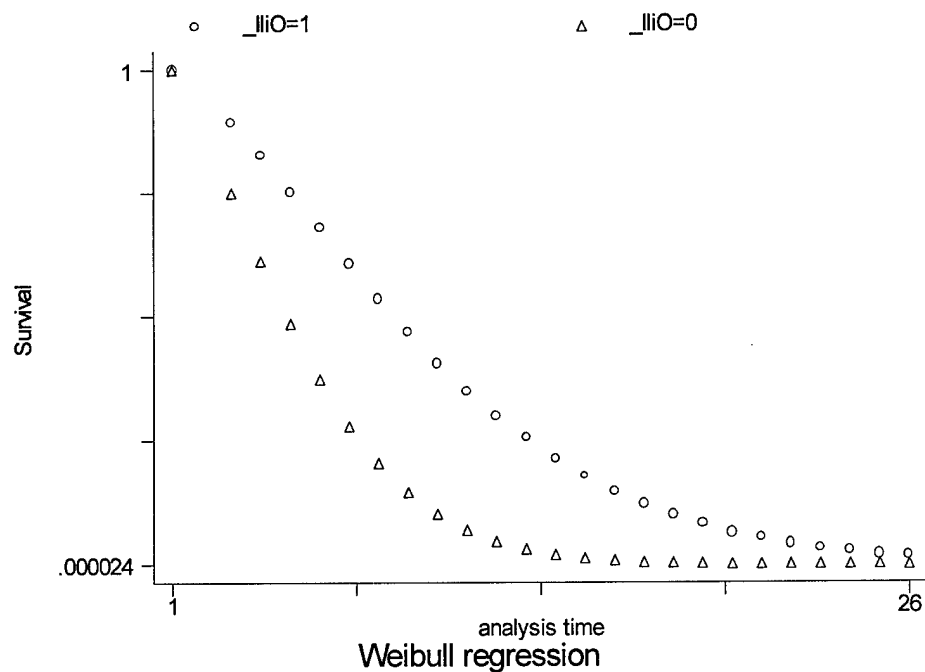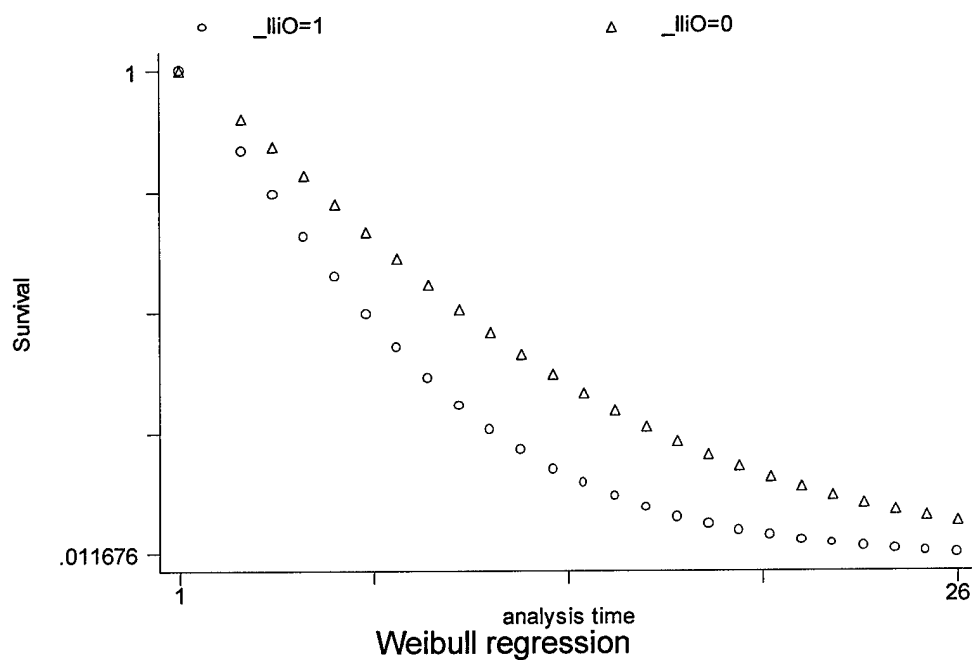**Figure 18 Provider listens (Education = advanced degree) (Yes=1 No=0) p<.01**
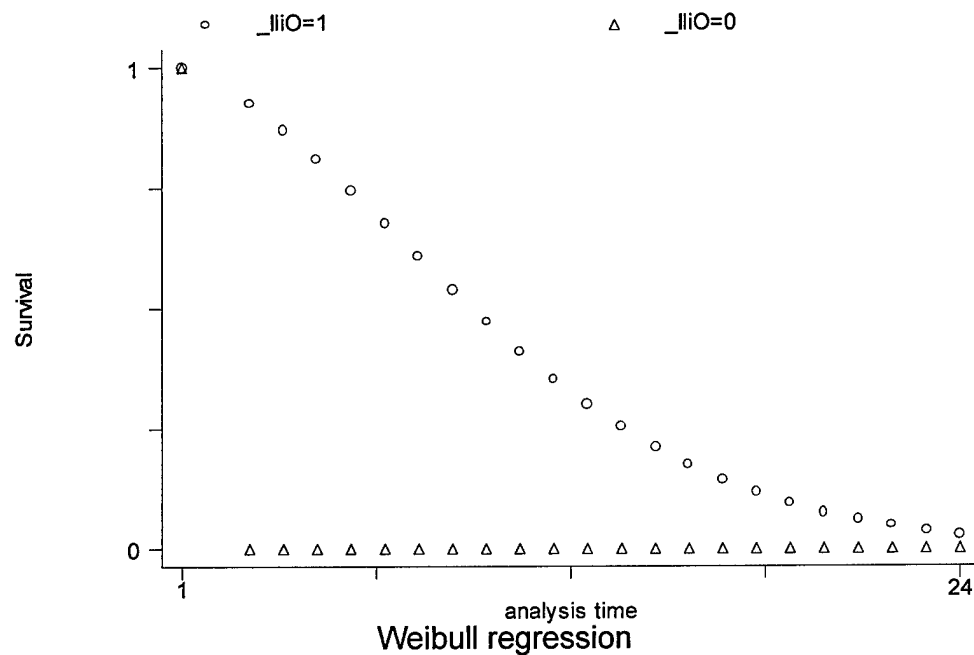
Figure 19 Confidence in provider Insurance=private (Yes=1 No=0) p=.07

Appendix C Survival analysis figures and tables

Figure 20 Provider listens (Race=Black) (Yes=1 No=0) p<.05

Figure 21 Provider listens (Health=excellent/very good) (Yes=1 No=0) p<.05

Appendix C Survival analysis figures and tables

Figure 22 Appointment difficulty (Insurance=public) (High=1 Low=0) p<. 013

Weibull regression